

Only 85p

# Commodore

## HORIZONS

February 1985

### THE COMMUNICATIONS TRIANGLE:

you, your computer,  
and your modem

### COMPUTER MUSIC

Benetti's synthesiser  
software packages

### C16 AND PLUS/4

Mastering BASIC  
V3.5 commands

### PROGRAMMING

Data porting methods  
made easy

David Whittaker of  
Terminal presents  
more Lozy Jones



WIN 5 Cambridge  
Computing SLOMOS

### LLAMASOFT

Psychedelic competition  
for C64, Vic 20 and C16

# NO FUZZ.



(Continued)

# NO BOTHER.

The remarkable new Ferguson MCDH TV is built on the famous TK chassis, so naturally it offers the best in picture quality.

But it also features DIN sockets for direct RGB and Composite Video input. Which means every signal, from whatever source, is transmitted directly to the screen without being demodulated.

The result is clear to see - and hear. No more fuzzy images. No more dull colours. Sharper wording and no hiss or hum on this sound.

Onscreen automatic source switching allows you to plug in your video recorder and any home computer with RGB output and leave them set up.

There's no need to unplug anything unless you want to carry the highly portable Ferguson MCDH around with you.

A computer monitor that's also a colour television is the ideal second set for the modern family.

#### RENT OR BUY

And now you can rent or buy the Ferguson MCDH from DER.

Rental costs just £8.95 a month. Further, you get a lead compatible with your computer and full DER service. Or you can buy the package for only £325.

Simply fill in the coupon now and we'll arrange a free home demo within 4800.

The Ferguson MCDH from DER will help you to understand all your programmes more clearly. No fuzz, no bother.

We supply leads for the following computers: BBC, Apple, Acorn, Electron, BBC, Citi 1600, Laser 1600, Sharp M60, IBM GB, Europa, Crayon, W2000, Amda, Vario, Colour-Cube, Sanyo M60, Newhouse, Janss M60, Clavin M60.

I would like a free home demo of the Ferguson MCDH Colour TV/Computer Monitor.

Name

Address

Telephone No.

I prefer to rent ☐ buy ☐ CH

My home computer is

Send to DER, Home Computer Dept., Apple House, Woodlands Road, Putney, London SW15 2NU. Please allow 14 days for receipt.

## THAT'S D E R DOES YOURS DO THAT

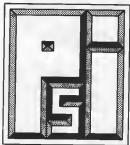
Order a search service and ask for a free trial copy of the book "The Ferguson MCDH TV" from DER, Home Computer Dept., Apple House, Woodlands Road, Putney, London SW15 2NU.





# BEYOND

CHALLENGING SOFTWARE



## WARRIOR

ORIGINALITY 10 • ORIGINALITY 10 • ORIGINALITY 10 • ORIGINALITY

GRAPHICS 10 • GRAPHICS 10 • GRAPHICS 10 • GRAPHICS 10 • GRAP

SOUND 10 • SOUND 10 • SOUND 10 • SOUND 10 • SOUND 10 • SO

LASTING INTEREST 10 • LASTING INTEREST 10 • LASTING INTEREST

ANIMATION 10½ • ANIMATION 10½ • ANIMATION 10½ • ANIM

OVERALL 11 • OVERALL 11 • OVERALL 11 • OVERALL 11 • OVERALL 11 •

# COULD IT EVER HAPPEN?



notes all at the same time!

**■** At the press of a button you can summon up pre-programmed rhythms and bass accompaniments to play along to.

**■** These three rhythm combinations can be speeded up or slowed down.

**■** You can even glissando (so long as you don't hurt yourself).

**■** That is, make a note slide up in pitch.

**■** You can filter sound (reduce the treble, the bass, or both). You can save, on cassette or disk, a voice or tune for future use.

**■** And, for better sound reproduction, you can connect

# MAKE MUSIC YOUR FORTE.

**■** Alright, let's all gather round the computer for a good old sing-song.

**■** You'll find the new Commodore 64 Music Maker strikes exactly the right note, whether you're an accomplished musician or whether you are an out-and-out beginner.

**■** If you can hum and know your ABC you can start to play famous popular tunes immediately.

**■** No matter if you've never played a note before.

**■** Simply type in the notes from the SFX Tutor Handbook,

then tap in the rhythm.

**■** And, before you can even say Richard Claydeman, the automatic playback fills the room with music.

**■** Once you've become a 'piano virtuoso', you'll quickly appreciate the Music Maker's other amazing capabilities.

**■** You can synthesise musical instruments, even create your own synth' electronic sounds.

**■** You can play notes polyphonically.

**■** (This is the smart way of saying you can play three different

Music Maker to your hi-fi system.

**■** Music Maker has been designed, like all our software, to get the very best out of Commodore hardware.

**■** It's the first in a series of packages which will fully exploit the Commodore 64's outstanding musical capabilities.

**■** Commodore software it costs no more, even though there's more to it.

**commodore**  
COMPUTER SOFTWARE



**■ MUSIC MAKER DISK OR CASSETTE £29.95**

## LETTERS

### PAGE

## Thanking you...

DEAR Commodore Jack, However, I am wondering in which computer to get. I am 80% sure that I'm getting a Commodore.

If you have any leaflets and software leaflets to hand out I would be more than pleased to get some.

Please could you put me leaflets on the last time I had visited off I had to pay for the books as if you could send me leaflets.

Thanking you,  
Don Anderson

Trinity Bar  
London

WT 5800 not having the leaflets. Try making the Commodore for the leaflets. Thanking you

## Print At ideas

YOU MAY be interested in this short software, which gives a PRINT AT function without the need for additional machine code routines.

To print or input at a specific point, use this routine prior to the required command. Use N—the volume required, 0 to 39. Use

Y—the row required, 0 to 24. These commands are the PRINT routine, which can be placed at any suitable point in the routine and is as follows: POKE 1024,X:POKE 1024,Y:SYS4072:RETURN

The values of X and Y can be modified to be required during the program. Four lines. Anonymous Oxford

## Reset defeated

RECEIVE how to stop Paul Taylor's reset switch (December issue) under the following numbers into location 32768 onwards:

32768 A  
32769 0  
32770 0  
32771 0  
32772 00  
32773 00  
32774 00  
32775 00  
32776 00

where A is the low byte of the address of a machine code program, to handle the fact that the reset switch has been pressed, and 0 is the high byte.

This substitutes an automatic cartridge ROM at address A 0.

For instance, enter the code with A=0, B=102, then POKE 44171,95. Type a small program like 0 ROM (001000) and press the reset switch. The screen should clear, but you can still LIST your program. Anthony Williams

EAJ-Casford  
Harrowdonshire

## Booga-boo-hoo

SEVEN months ago I purchased the great game Booga-boo the Film from Quaker's. However, after teaching the top of the class I cannot find any way to jump through the screen. Could anyone and offer some advice?

Philip Morgan  
South Arden  
Stafford

IT'S isn't the only letter we've had asking the same question. Anyone got an answer?

## Flying tape

IN YOUR December issue you reviewed the Copernicus/Intimate Sublight Flight Simulator 2 program, and I am very interested in buying a copy. However, you say that because of the complexity of the program it's only available on disk, and I don't own a disk drive. Yet on the same issue, the same suppliers claim when you obtained the review copy on disk, are advertising a version on cassette (Page 10, 10 Suppliers Co.).

I would be most grateful if you could clarify the apparent contradiction, and if you could tell me if the cassette version differs in any way from the disk.

Grant Mills  
Liverpool  
Merseyside

YES, 64 Supplies does now offer a version of the Flight Simulator 2 on tape, which wasn't available at the time our disk review was written. The disk version was a reasonable screen picture, with some features of the simulation being loaded on the program cassettes.

Was the only reason that the tape version is substantially the same, but has to be loaded in separate sections. We'll be trying to get hold of a tape version to check it out as soon as possible.

## £10 prize letter

BECAUSE we know you're all busy people with plenty to do, we're offering you letters to spend your valuable time writing to Commodore Magazine. Each month we'll give a £10 prize for the most interesting letter we have received, whether on hardware, software, computing, or life in general. The ball's in your court... get writing!

This is the chance to win your share — send your tips, comments and compliments to Letters Page, Commodore Magazine, 13-15 Little Newport Street, London WC2N 7PP.

COMPUTER

LETTERS

COME BUY I'VE WRITTEN A FAST AND ORIGINAL ALGOL!

I CAN'T PURSUE YOU! YOU CONTROL A LITTLE YELLOW WING AROUND A.

WHADAYA MEAN IT'S ALREADY BEEN INVENTED???

## Collins goes soft

Each box is intended to help software owners put their machines to a practical application. Each contains a historical booklet and program, and Collins Soft's publisher Graham Taylor promises to carry on in an attempt to "influence the direction and form of software development away from games and computer literacy to software that actually does some thing." Contact: Collins Soft at 8, Grafton Street, London, W1R 5AH. 01-492-5815.

## Record-breaking US software



Amstar's Archivist label aligns with a series of packages from top US home furnishings and electronics

Times include Chaplains, as well as you have to pick a bookkeeper and a secretary.

For more details contact:  
Aardmaff, Sars 185/8,  
Aphelie House, Palace  
Sars, London SW1 6-114  
1970

## Cheat sheets

For more details contact  
Phoenix, 14 Yarnon Road,  
Buckley, NSW 2133, A.S.  
Phone 02/23-21109.

They and partner Roger Taylor of Walnut Design must Co have moved to Queensland after a disagreement with Graham Gurnham. The first Queensland game was by **Black Thunder**, a version of Graham's *Snakey Express* (read a version of *Admiral's Luck*). The monster is in the original version, which involves speeding along a fantastic railway system, speeding attack by fighters, bombers and tanks, has now been replaced with a buggy and the money on the game has been replaced. The original without speeds effects are not included, but **Black Thunder** is also compatible with Corbett's *Snakey Express* machines.



Wang, J., Brown, J., Greenberg, M., Brown, J., Gaudin, and Ahmed, N. 2004.

Black Thunder will cost \$1.99 on tape and \$1.95 on disk. The next program in the series is called *Impulse*, and is due for launch after Christmas. Tropic's deal with Quantum covers these two series only, says its director.

ment with Canada started on their quest to sign an exclusive contract. As a development company in its own right, Wood will be able, in the words of Roger Taylor, to "free our time and capital to concentrate on new sites."

## Tony's travels



## Panda bears up

INSPITE LAST year's temporary shortage of Commodore disk records being finished, data still seems to be in demand for efficient, affordable, conventional records to be used with the 64.

The Panda 20/40 interface costs £17.95 and is produced by PACT International. The interface also works with the 700 20 and features a special phase switch which enables it to cope with different types of tape recorder and tape quality. It also features two LED's, a red one to show when data is being saved and a green one for loading.

The Panda 20/40 has been tested with twelve leading programs, and will be available through electrical, television, hi-fi, video and computer shops. Contact PACT International, PO Box 88, Frieschamph, 0713 271600.

## Computer brains

FIFTEEN YEAR-OLD Peter Chant of Cambridge has become the Sunday Times Young Computer Boss of the Year.

The competition, sponsored by the Sunday Times and Commodore, involved developing a new idea for a computer application which would benefit society. This year, the theme of computer contributions was being implemented, and Peter's winning idea was "Comsol", a system for selling and comparing.

Peter's prize included a certificate from the Sunday Times, and an £25.00, spoken, MCI 803 colour printer and software packages, total value £1000, from Commodore. The prize was awarded by the President of the British Computer Society Dr Ewan Prior at a lunch at the Windsor Hotel in London.

Seven prizes, totalled at £5.00, peripherals and software were also given to the other prize winners. Commodore 40's, peripherals and software worth £100

# Scope widens for ISP



ISP MARKETING, producers of the games design language Scope, have been bought out by their American distributors Codewarrior.

Codewarrior's specialty is program generating software, and the company claims to have been leader in the field for four years. Graham Lomas and Alan Peck of ISP Marketing, former Marketing and Technical Director of Codewarrior UK, which will be producing largely disk-based software.

Initial releases include *The Writer*, *Report Writer* and *Menu Writer*, which enable businessmen to tailor applications packages to their own specifications.

*Adventure Writer* is a specially advertised game created based on *The Shell* from Goliath. *Imagepro*, and *Diagram Writer* is another

adventure writing package, while *Design*, is an interactive tutorial program which allows you to see multiple choice questions as they are answered.

*ELP*, (Easy Language Parser), is a visual problem solver, and the original Codewarrior program generating package also available.

The Codewarrior history in Britain will be producing software in several European languages, and the company will be interested to see the out-of-the-box programs using their packages and consider them for commercial marketing.

Peter will be "in line with UK usage", and there's a demo disk available from the company for £9.95. Contact Codewarrior, PO Box 11, Birmingham 10, Birmingham, 021-2144.

## CBM \$25m payout

MORE DETAILS of Commodore International's purchase of Amiga have been announced. A recent quarterly statement reveals that around £20m in cash and stock has been paid to acquire the company, which will gain Commodore 17 magazines and the rights to the much-loved Lorraine personal name.

Financial analysts have responded cautiously. Although details on the Lorraine, revealed in a previous issue of Commodore Horizons, are promising, but it will face stiff competition from the Macintosh and IBMPC. Commodore share prices fell after the announcement of the purchase details, though shares were said to be at a high level.

The lawsuit against Amiga by the chairman of Amiga, Jack Tramiel, former head of Commodore, is still pending. Tramiel alleges that technology developed by Amiga for Amiga is being transferred to Commodore under new arrangements. Commodore executives say that the lawsuit won't delay the debut of the Lorraine.

## New man

COMMODORE UK has appointed a new Marketing Manager, David Gerrard. Formerly with electronics giant Philips, Gerrard was involved with the company's business computer project. He was also employed as UK marketing manager for Texas Instruments calculators and watches.



His responsibilities will include marketing of home computers, software and peripherals, but will also extend into Commodore's attempt to crack the UK business market.

# L9 disks

ALL SIX OF the popular Level Nine adventure games have now been made available in disk format.

The Commodore 64 games include *Return To Eden*, the latest release, the space adventures *Starblast*, *Colonial Wars* and the Middle Earth trilogy.

The disk versions will cost £11.95, and cassette version owners can exchange them for disks with a charge of £2.50 to

cover costs.

The new Level Nine cartridges fit all the programs, and comes in an A1 power format. The cartridge shipments will be changed every two months, and if you're interested in getting a copy you should send a medium card to: Level Nine, 115 Hagley Road, High Wycombe, Bucks HP12 3NG.



# SOFT★HITS

## White wizard

**T**he latest in the range of wizard games from Tynes, is *Wizard of the Sorcerers*, a Tolkien-esque fantasy to magical mythos in common with the whole Tynes range. *Wizard* features very skilled, colorful graphics programming, combined with the formidable prowess of

software wizard. It's a very A11 package, though the story



isn't the original. You control the wizard Gandalf, moving him around

the battlements of his magic, magic and flying dragons in the attacking Lizardmen. There are lovely little death-room explosions when you want a bit, and occasionally you have to avoid water power from a magic star, and a powerful spider tries to join your leg.

Should the battlement power the castle and taking your appearance, you must

follow their castle and use the battlements with different gold coins. Later it is too long and an attack comes along and steals the coins. An attack? What's that doing there?

Overall, very slick, though not a great challenge.

**Program:** *Wizard*, 14

**Supplier:** Tynes

**Price:** £5.95

**Graphics:** ★★★★★

**Sound:** ★★★★★

**Gameplay:** ★★★★★

## Radio-active

**O**ne of these games where it's necessary to arrange a free weekend to be sure of completing it. *Comedian* is *Midnight* features a very impressive graphics 3D effect which will draw a gasp at first sight. The scenario is a 2000-room nuclear plant threatened with disaster as the core begins to

overheat. You control a number of robots which must be led to the core and used to stabilize it.

Each chamber can be viewed from a number of different angles, and will contain equipment which can be either useful or dangerous. Your robot can only carry a certain amount of equipment, so choose carefully — it would be frustrating to get right through to the core only to find that you hadn't picked up the necessary Clay Ball or

Snobot along the way.

The scenario is quite good, though the figures are small.



Particularly irritating is a room of traps called A&P which drains your energy, though there are also rooms

where you hang around which have to be avoided.

A very nice challenge for the sort of game player who enjoys making maps, and who doesn't mind waiting a long time from human contact for the kind of slow it will take to complete this complex game.

**Program:** *Comedian*, 10

**Supplier:** Creative Sports

**Price:** £7.95

**Graphics:** ★★★★★

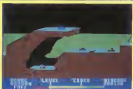
**Sound:** ★★★★★

**Gameplay:** ★★★★★

## Future tense

**Y**ou arrive from the future of the strange past. And this time is a bit, rather like a side involving nothing of the game itself which is based on a truly future vision with some game, *Centaur*.

Using the strange world and dreams are your drive forward, you move from mountain out of an under ground base, then avoiding UFO's land on one of four planets. The scene then changes to the landscape of



that planet where you move back up that peak with your little brain making moves from your equipments and

the effects of gravity which changes it and you use the ground.

At the risk of sounding

foolish to the many experienced computer who are doing marvelous things in the 16-bit price range, 1992 is exceptionally playable, much more fun than many 16-bit level programs and although the idea isn't really speaking an original one I don't remember anyone having copied it off to a Commodore screen before. But sorry to mention the production another little detail which you should all look out and buy it now.

**Program:** 1992, 14

**Supplier:** Microvision

**Price:** £1.95

**Graphics:** ★★★★★

**Sound:** ★★★★★

**Gameplay:** ★★★★★

## Inkworm attack

**Q**uicks is a pleasantly unusual offering from the underdog Supersoft. It is a point, rectangular and one of speed and quick decisions as the ball of glass is not only a very quick, but also a

best of them of writing paper.



You play *Inkworm*, a small creature, points and its

signature to the music of its voice. First start of paper must be detected at all times, from the changes of the situation. The rule can be covering up their ink signature with TIPPIT covers my line. Watch out though, for the paper-cutting monster and don't drink too. Going way to the computer of the way much appearing at the side of

the paper can lead to a risk from the divided screen.

Unusually clear graphics and nice rapidly, sound effects, as you watch on the unknown maker *Quicks* a brilliant game.

**Program:** *Quicks*, 14

**Supplier:** Supersoft

**Price:** TBA

**Graphics:** ★★★★★

**Sound:** ★★★★★

**Gameplay:** ★★★★★

# SOFT★HITS



*Maintenance, Service, Support, Training, Installation  
all from Chromasonic Business Systems*

## The Pegasus System

### STAND ALONE OR FULLY INTEGRATED

Fast, precise accounting power  
right at your fingertips



Please us now to see how Pegasus accounts programs can  
help you and your business

## Special Offer

For further details of a very  
special offer of  
**FREE SOFTWARE**  
WORDPROCESSOR DATABASE  
SPREADSHEET  
with every purchase of a  
Commodore business system  
**PHONE US NOW**

## Commodore

**8098D**  
128K Computer  
Integral disk drive  
and monitor

Wordprocessor,  
Database, Spreadsheet  
and  
DOT MATRIX PRINTER

**£1690.00 + VAT**

## Commodore Business Equipment

8098D/807 with Hi Res Graphics	£1645
8098D 128K Computer	£715.00
5001001 Single disk drive	£555.00
8098D Dual disk drive	£805.00
40023 Dot matrix printer	£815.00
1381 Dot matrix printer	£560.00
Fit to IEEE cable	£37.00
8001 to 8098	£31.00

NB - All prices are exclusive of VAT

## Superoffice

**The Ultimate Commodore Office  
Administration System**

The complete office automation  
system with Full Records  
Management Calculator Word  
Processing and Spool Counting



# CHROMASONIC

# PERSONAL COMPUTERS

48 Junction Road, Ashbury, London, N10 5RD  
Tel: 01 263 5483 and 5485  
239 Marwell Hill Broadway, Marwell Hill, London, N10  
Tel: 01 263 3706

# SOFT★HITS

## That's all folks!

Based on the same sort of concept as the old Road Runner cartoons, *Cliff Hanger* is a good idea which doesn't quite come off. The back grounds are drawn in a cartoon-like style, though the animation of the characters

soft up to the same standard. The idea is to stop a head falling through into oblivion.



using the standard methods of the cartoon hybrid, dropping

rock on his head. Missing him with a cannon, spending here with an arrow, and so on. You must figure out how to use the objects found in the first ten screens. Therefore you must also take account of how if you want to survive a screen, and on the final level every game in which you had to stop the head can cost you a life.

At times the computer tries to give the action and presents you with a report, about 20

which are very funny. The problem is that playing *Cliff Hanger* is like having an inflexible job — like the last time. The comedy soon wears off, and without a little variation the graphics aren't enough to sustain the interest.

**Program:** Cliff Hanger, 64  
**Supplier:** New Generation  
**Price:** £7.95  
**Graphics:** ★★★★★  
**Sound:** ★★★★★  
**Control:** ★★★★★

## 8,192 blows

We always expect great things from Taitan, but in *Hyperion 192*, and in *CADAM Warrior*, lacking something to separate it certainly makes up for it in scope.

Incorporating an amazing 8192 screens (I know, but it counts) these all support *CADAM Warrior* is in the (popular) top the ladder and solved the problems before going on to the next screen? Inside.

You control a disk robot which is played as a computer. *CADAM Warrior* computer aided design and computer aided architecture.

machine in order to find the missing energy module on which are mounted the human element machine from the



and in a 40000 program. The intense defense is done. Don't like the idea of course and then perhaps find the battle.

attacking species, in the shape of waves, energy belts, and half-fused great objects — are much animated and repeated

with the same lighting. The action all seem to look pretty much the same, though, a lot of detail is brought to the

screen by mechanical lines through which you shoot drops to reach the underside.

The same screen is enough to eliminate all the attacking elements, and you are then allowed to visit a defense screen to move on. It all becomes more complicated as you reach the heart of the machine, but you get the point early.

Overall, provided for multi-screen shoot out on tracks, and perhaps for those of us who don't have extra days which can be set aside for single playing.

**Program:** CADAM Warrior 64  
**Supplier:** Taitan  
**Price:** £9.95 (single), £12.95 (box)  
**Graphics:** ★★★★★  
**Sound:** ★★★★★  
**Control:** ★★★★★

## Manic monarch

Two popular words have come together in one package from English Software. The first is the super for spirit in the character exemplified in *Mad Truck Software's* offering *Dr. Binky's* (reviewed last month). The second is the eternal ladder, and platform, game, called

off by *Manic Monarch* and will keep you hooked through it's well past 60 games.

However, if you're going to do a LAF you should at least do a good one, and *Manic Monarch's* *Little Henry* is a mature game, set out to investigate the importance of his police. Each screen contains hazards which must be avoided, and games which must be collected in order to progress to the next level.

There are eight screens, each down with excellent animation

in detail and a cartoon-like style. The animation of the little prince and the hazards.



with a changing background, whirling blades, fire, and snapping snakes, in very good

drawn effects are OK, and there's a nice little sequence where *Henry* looks from one screen to another.

Overall it's quite enjoyable, and has the sort of "you do more game" satisfaction which makes platform games so popular. It's certainly suitable for a second of being original.

**Program:** Henry's House, 64  
**Supplier:** English Software  
**Price:** £5.95  
**Graphics:** ★★★★★  
**Sound:** ★★★★★  
**Control:** ★★★★★

## Octopus

Proving that it is possible to do good things with the unproven *Big Tasty House* is a better title, from *Software Projects* from me as someone in a cooker. It doesn't look like an octopus, but that's not the point.

The idea: literally, it's a creature trapped in a



cooker. It has to push up drops of condensation from the top of the cooker, down to the bottom and use

them to clear the doors before it's released. There are ten cookers which include additional hazards such as cooking oils, bits of food and the dog *Fifty Fifty Henry*. And you walk on so fast! Right. The space ship screens are very colorful and the animation is very smooth as it moves around the cooker. The sound effects are adequate and although I didn't get as far as reaching the

apron, *Henry* is a good game. A few options without being too much before I was finally done to a turn. A very good little game, which has given me the idea of a creature used from the local Chinese laboratory.

**Program:** Henry's House, 64  
**Supplier:** Software Projects  
**Price:** £5.95  
**Graphics:** ★★★★★  
**Sound:** ★★★★★  
**Control:** ★★★★★

# SOFT★HITS

## Zap mania

Some of you will remember Jeff Minter's *Hill Gator*, a shoot-'em-up of such staggering violence that it should have come with a government health warning just to prove that *Hillman* didn't have the copyrights on software for disaster movies. Software Super Stores have released the Revenge of the

*Quads*, in respect of more recent snuff, a probably escaped.

From the moment you hit the fire button this one is all action. Across the top of the screen, seven space-like ships, protruding from your screen by loads of antennae. Unless you maneuver your ship skillfully enough to blast the invaders, they'll drop to the ground and halfway humans. You have a few weapons to use: the homomade ones they're on this way up, but the space-ships have a nasty tendency to

blow you up, even with a tricky sideways shot.



The shooting damage—which is difficult to watch while you blast the masses—means that this one's a *kluge*.

And game, means no rubies, and a language I can only almost understand. It's nothing as life as some more than a few pleasurable moments blinding hell out of the gods, this is the one for you.

**Program:** Revenge of the Quads, VHS 48  
**Supplier:** Software Super Stores

**Price:** £1.99

**Graphics:** ★★★★★  
**Sound:** ★★★★★  
**Control:** ★★★★★

## Flying start

This isn't the most sophisticated, realistic or demanding flight simulator for the 64, the best ones in these categories start in the *Seabird's* Flight Simulator 1. *Flight Pilot* may, though, qualify as the most exciting flight simulator, instead of just wowing around the city looking for a landing site, you get the chance to kill something.

The graphics aren't as good as the *Seabird's* original, but the sound is of course much better. You have a window view from



an F-15 fighter, and you can select a number of mission options.

In the full version of the game, you must take off, see your map mode and radar to locate enemy planes, plot a course to intercept them, shoot them down, return to base and land safely.

The controls are well-chosen, though it helps to have a joystick, and the landing sequence is so realistic it's terrifying. It plummeted into the terrain about twenty times before I got the hang of it—glide as at low level, watch your winged indicator to avoid stalling, and remember

to put your wheels down.

*Flight Pilot* overcomes which incorporates a good deal of useful and, importantly, accurate instant info on the F-15, help to make *Flight Pilot* a real killer. I can't wait to get my hands on the cheaper mini version *Tempest*.

**Program:** *Flight Pilot*, 64  
**Supplier:** Digital Interactive  
**Price:** £1.95 cassette, £14.95 disk

**Graphics:** ★★★★★  
**Sound:** ★★★★★  
**Control:** ★★★★★

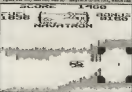
## Apocalypse now

Yet another hot favorite from the States, *Fort Apocalypse*'s been known as the reinforcement of the challenge to present, making each game different.

You play a prospector armed with a underground laboratory, avoiding enemies and traps, dropping bombs and firing missiles, negotiating laser traps and searching for your old lost comrades.

The scrolling screen is a familiar feature now, so it doesn't have as much impact as it would have when the game was first released. As a

result it's a bit difficult to figure out why this one was up



successful in the US. There's a lot of money involved when you have to land to refuel, or

when you get right through the labyrinth to the fort, which has

built as good as, say, *Palace Patrol*. The sound effects are disappointing, and there's no real attempt made to create an illusion of 3-D.

In its favor, there's a more Defender-style organizational radar screen, and a high level of destruction and devastation. It will certainly please many game players, but *Fort Apocalypse* doesn't manage to make much interest compared to many of the other US Gold offerings.

**Program:** *Fort Apocalypse*, 64  
**Supplier:** US Gold  
**Price:** £1.95 cassette, £14.95 disk

**Graphics:** ★★★★★  
**Sound:** ★★★★★  
**Control:** ★★★★★

## Jungle bangles

This is a first screen impression-darker in which *Jungle Jim* has not so much lost from the console. *Jim* now has a new look, pursued by a hungry lion, leaping and sliding in most areas which

will otherwise inspire an orange. Screen two, like *Patrol*, has been leaping from side to side (and the lion, on the lookout for lunch, fast, like him up to make the connecting lines). *Jim* now shows a full leaping and crouching, which has a new up a realistic leaping bouncer, and lastly there's the realistic. The main one is



covered with *Jim* changes into the part of looking over if you don't overcome all the

hazards in time.

Unhappily, but this one isn't going to rattle you through the most recent version of *Jim* on the standard.

**Program:** *Jungle Quest*, 64  
**Supplier:** Digital Interactive  
**Price:** £1.95

**Graphics:** ★★★★★  
**Sound:** ★★★★★  
**Control:** ★★★★★

# PSYCHEDELIA

PSYCHEDELIA —

YOU CANNOT WIN  
YOU CANNOT LOSE  
ONLY ENJOY

PSYCHEDELIA —

THERE IS NO FRUSTRATION  
THERE IS NO KILLING  
ONLY PLEASURE!

PSYCHEDELIA —

SWITCH ON TO MUSIC  
SWITCH ON IN THE DARK  
ONLY SWITCH ON!

PSYCHEDELIA —



*fit* *Minter*

# LlamaSoft

ORIGINAL SOFTWARE DESIGN

SHIRTLY AVAILABLE FOR AMSTRAD, SPECTRUM, AMSTRAD

AVAILABLE FOR IBM PC, C-16, VIC 20



# Opening up the world of networks

Hardware and software reviewed by Brian Lloyd

**MAIN FRAME:** business computers have long had the ability to communicate with each other, passing information backwards and forwards as will. Until recently this has not been possible where the home micro was concerned. However, a new possibility for the humble home micro to communicate with another micro, and what will, is, and even be networked by, then goes before.

This opens a very big door for the home computer, for out there is a wealth of information and facilities waiting for you. The list of things you can do is endless, and would take up several magazines the size of this one to cover them. Among the networks that await you are Prentel, Microsoft 800, Bulletin Boards, and the latest innovation by Commodore, Compuserve.

What can you do on all these systems? Well, have you ever wished you could get information on your dream holiday, or book a theatre ticket, or see what's new in software for your computer and if you liked what you saw, download it? All this is now yours for the asking. Before you can do all of these things you must have some way of connecting your computer to the outside world. To do this, you will need a MODEM to connect your computer to British Telecom's telephone network.

A word of explanation of the various systems available to you would not go amiss at this time. The main band rate is 1200/75. This means you require a 1200 baud per second and transmit at 75. This is the system that Prentel and Microsoft use, and many Bulletin boards. Probably the next most used band rate is 300/100 full duplex, as this is used by most bulletin boards and used to most communications. Finally there is 1200/1200 full duplex — the system you require and transmit at 1200 baud but can only operate in one direction at the time. 1200/1200 band full duplex is most usually for use to use computer-to-computer.

## Systems

Now for the various systems available. Prentel is run by British Telecom and provides every kind of information you could imagine, as well as allowing you to book your next holiday or just browse through the latest share prices. Incorporated in the Prentel network are various other organisations such as Microsoft 800. This service is aimed mainly at the computer user and provides such things as downloadable software as well as many other facilities. Bulletin boards are run by volunteers who are prepared to give up their spare time and quite a lot of money, to

run these excellent services, mainly free of charge to the user. There are no major bulletin boards up and down the country it would be impossible to survey them all, but what can be said is that they all provide a very friendly information service on a variety of subjects.

Choosing the right modem is not an easy task, as it may not work on your computer, or it may not have the facilities to get onto the services you require. I will concentrate on modems for the Commodore 64, but what follows is common to all computers.

There are several aspects to consider when buying your modem and they are:

- (1) Is it compatible with the computer?
- (2) Can I get an interface and software to make full use of it?
- (3) What do I want to use the modem for and will it carry out this task?
- (4) If I want to download software are there facilities to do so?
- (5) Can I send messages or programs to other home computer users?
- (6) Is it a good value for money?
- (7) If I change my computer will it still work?

The first modem we will look at is the TELEMODE 3 together with the COM 64 Commack Pack. This is the one supplied by Microsoft 800 and the only one recommended for downloading this software. The Telemod 3 is a very neat unit, just the right size to stand a telephone on. On the front there are just two switches and three LEDs. One switch is to control the carrier

line function while the other controls the local rate mode. The LEDs are for power on/off, carrier signal and line on/off. The COM 64 Commack Pack comes in a neat plastic case that fits snugly into the carrying case. Connections are very simple. A telephone lead supplied plugs into a BT wall socket, whilst your telephone plugs into the back of the modem. The same connection is from the modem to the carrying case. Finally plug the modem into the mains supply.

The Commack Pack takes care of the RS 232 interface and the operating software. On power up you are presented with a menu and by selecting one of the options you are taken into the software. The instructions inside are a bit sparse, but with the care to follow them they are not really complicated.

The whole operation from first power up to menu screen, and whatever option you choose you are guided to the next step to take.

## Functions

From the menu you can see there are a lot of functions that are available to you. Although the manufacturers claim it to be mainly a Prentel modem you will see from the options they are being quite modest. It can be used for Prentel, Microsoft 800, Bulletin Boards, or run other systems on 1200/75 band. Open to User 1200/1200 band half duplex, Chat Mode 1200/1200 band half duplex.

Another modem from the COM 64 modems is the Telemod 3. This is a main band rate modem with 300/100, 1200/75 full duplex and 1200/1200 band full duplex. An added feature is auto answer, that is, if it is left on in the auto mode it will answer the phone with a tone so that a message can be left on your computer, or, with the right software, you could run your own bulletin board. The Telemod 3 works with the COM 64 Commack Pack but requires an interface program to run on 300/100 band. It's the

MICROSOFT 800 COMMACK

THIS IS A COURSE TEACHING YOU HOW TO  
WRITE INSTRUCTIONS FOR MY COMPUTER  
WHICH UNDERSTANDS BASIC.

THIS IS A BEGINNERS' COURSE, AND IT'LL  
BE FOLLOWED BY COURSES OF GRADUALLY  
GREATER COMPLEXITY.

TO START OFF WITH, THOUGH, FOLLOW THIS  
WEEK'S Starter Course! Further classes  
will continue the course next weekend!

ENTER 4 TO START

■ Since this is the Telemode II box has two switches, one for auto or manual answer and one for on/off line. There is also a knob to switch between the different baud rates and an approved test LED. Besides we see for the Telemode II box with the added feature of 800/800 baud full duplex, so you will be able to use the bulletin boards and information services that use this system. You can, of course, transfer files now to run on the same baud rate, slower but more than 1200/1200 half duplex.

The Telemode TM 110 modem is quite large as modems go but nevertheless quite smart. There are no controls on every about as everything is software controlled. The only indicators that the modem is on are the two LEDs on the front right hand corner.

The interface and software come on a small PCB with all components exposed and plugs into the cartridge port. The interface board, in my opinion, should have been put into a case as plugging it in and out of the cartridge port is not easy and it could be damaged. The TM 110 has up-to-date and is capable of storing eight telephone numbers plus your ID and password. Storing the telephone numbers is quite simple, and as close to the off line mode from within the program. Once entered the modem receives the numbers in its memory with the aid of touch buttons. Once you have mastered the tricky art of plugging in the interface board and connected up the software cables you can then power up the computer.

### Options

On power up you are presented with a menu giving various options. Before you can proceed you must set up the output device — disk drive, printer etc. All operations are menu driven and are fairly simple to follow.

On first, the Telemode TM 110 worked well except when it came to downloading software. Downloadable programs have to be obtained when using the TM 110 with the Commodore 64 interface pack. To get your programs to run you first have to download a software program from Protek, then you have to type in and save a short program from the manual or from a listing on Protek. This is where you may have some problems, for the program in the manual and the program listing given on Protek differ and the manual is not at all close to how to use the software programs. With trial and error I did manage to tolerate a program and convert it.

The TM 110 is a 1200/75 baud modem but with its optional programs available an extra cost it can operate on 800/300 baud. Again, it can access Protek, Microsoft 486, Bulletin boards, or any other system operating on 1200/75 baud or with the optional program 800/300 baud system.

My big worry with this package is the interface board. I would have been much happier if it had been in a case. Otherwise as it is proved very easy to use and apart from the fact of the modem it is very easy.

The Minolta Technology 901 3000 modem is truly a multi standard modem with every type of baud rate and option you



are ever likely to need on the UK or abroad. All controls are very clearly marked on the front of the option and are controlled by three knobs. There is also a list of add-on accessories available such as auto-dial and auto-answer plug-in boards. To use the modem with the CBM 64 you will have to decide what software you are going to use with it, as only a listing is supplied with the modem and this only allows 800/300 baud operation. The only option I am aware of do not allow full use of the many options available on the WS 3000. What software you use determines what modems you will need and, in fact, what add-on accessories you can use. One option that works very well is the CBM 64 Command Pack with the Telemode II cable and the 800/300 baud download program from OS Ltd described earlier. This will allow the modem to be used on CBM-75, CBM/1200, 1200/300 baud rates, but will not support the auto-dial and auto-answer boards.

Another alternative is disk based software from PDI. To use PDI's software you will require the BS 212 serial interface supplied by Minolta Technology, as the software was the last part to communicate with the modems. As supplied the disk based software will support 300/300, 1200/1200, 400/800, and 1200/75 baud

operation. One of the unique features of this program is that it allows you to enter a vast amount of telephone numbers on the program disk. When the program has loaded the pages of names stored are presented on the screen, just pressing the letter next to the service you require will automatically dial up the number if the area dial tone is fitted. If not, you can dial the number displayed yourself.

### Dialling

There is also a ring-number facility that allows you to choose several numbers you want to try and will ring each one in turn until it gives an answer. This is most useful when dialling up Bulletin boards as they always seemed to be engaged. The next alternative I discovered by accident, but it might prove to be the cheapest way of using the WS 3000. The software and interface that is supplied as an extra for the Protek 1200 (per area error) will work just as well as the WS 3000, although you will have to change the plug from the 5 pin DIN socket to a 25 pin D connector. However for the price it is well worth it.

The WS 3000 worked well on all of the options I tried, and can be used on any system for which PDI can supply manuals.

Product	Supplier	Price
Telemod 1	O.E. Ltd, North Point, Cleeve Industrial Estate, Pwllheli, Cumbria, LA11 9BN	£65.95
CRM 64 Comm pack	O.E. Ltd	£64.95
Telemod 1	O.E. Ltd	£175
TM 116	Twelve Marketing, Alfred Road North, Malvern, Worcs, WR14 2TL	£113.95
CRM64 board	Twelve Marketing	£44.90
MS/280 board (ready prog)	Twelve Marketing	£29.15
W5000	Marble Technology Ltd, 18/12/30 Park's Street, Ipswich, IP1 1LR	£229.95 + VAT
W4312 v1	Marble Technology	£19.95 + VAT
Protek 1200	Protek Computers Ltd, 14 Young Square, Brimsford Industrial Estate, Luton, Bedfordshire, LU3 1JN	£79.95
CP + software	Protek Computers	£14.95
Compuport modem	Compuport, 1 Windsor Road, Weydon North Industrial Estate, Collyer Northants	£79.95 incl. 1 year Compuport membership

software.

Marble Technology has come up with an excellent modem, but has unfortunately neglected the software side. It has had a car window as input. If you decide you need more than the basic ones then this is the one for you. However, if you just want Protek then this would be an expensive way of getting it.

The Protek 1200 is quite different from the modems we have looked at so far, this one is an external modem so therefore does not require use of BT's new plugs to work. The modem is completely self contained and only needs four AA type batteries to power it. The basic use and software pack come as an optional extra, and together with the modem, is by far the cheapest package I have seen for the Commodore 64. The modem does require you to have a telephone that has round ear and mouth pieces so it is unsuitable for telephones.

The software is cassette based and once loaded is stored direct and supports call, call out, save and load frames, change ID and also to start options and has 1200/75, 1200/1200 baud. However the software does not allow downloading of software. The aim to say seems to be aimed at it allows machine code programs to be loaded onto the computer at a different machine to which it was saved and also allows the receiving computer to reboot at which saved. This option would be quite useful when two different computers are being used. However to use the option both computers would have to be using the same software, but not necessarily the same modem.

The modem itself is quite straightforward and is typical of acoustic modems in operation. All that is required of the user is to make sure the telephone handset is pressed firmly onto the edge of the modem and switch to the hand set when required, the rest is handled by the software (except dialling the telephone). On test, the program and the modem worked well. If

you want a portable modem then this would appear to be the one to test your requirements. It can be used for Protek, W5000/4312, Bullman boards or 1200/75 baud, plus 1200/1200 baud half duplex rate to test.

The Protek 1200 must be one of the cheapest ways of getting into Protek or other 1200/75 networks. Despite the price the whole unit is more than adequate for



the job if you are not interested in down loading programs. You will also be equipped for 1200/1200 half duplex rate to test.

The last modem we are going to look at is a completely different to many reports to all the others we have looked at. Compuport's own system for the Commodore 64 is the Compuport Modem. Where the Commodore Modem differs from all the other modems is that it allows you to get into Compuport's own system designed especially for the CRM 64, called Compuport. Buying the modem on its own however is not going to get you very far. When your modem arrives it will be accompanied by an application form to join Compuport, which you will have to fill in and send back together with an open banked standing order. You will then be sent your ID and post code to allow you to use all Compuport's facilities.

To access Protek from Compuport you will have to download a software program. This also applies to test to save com-

puters. At the time I reviewed this modem the programs were free but I understood that these will be charged for at a later date.

Back to the good points. As I said earlier there is a lot of good quality free software plus lots of commercial programs at discount prices. The jungle area, as it is known, is for Compuport apps to get to their web. Programs can be updated and sold although Compuport gets a share of the price you charge. There is a mailbox so you can send messages to other Compuport users. The list of uses and facilities is quite long. I must at this point warn you that if you want to use Compuport during the day is a very expensive (over pounds per hour) as you will have to hold it from the time when they are on hold!

The modem cannot be used for Protek and can't use any communications without additional software which again you cannot obtain without joining Compuport.

## Decisions

It may be very difficult to make your mind up what modem to buy, as none of the ones I looked at would allow you to access all the options apps to you. Some of the modems were capable of operating on many different baud rates, but did not have the software to drive them. No other modem except Compuport's own would be capable of accessing Compuport. Although most of the software for the modems was written by Y1 Computing, it did not seem possible to get different types of software on test to suit communications, which means if you intend sending messages or programs to use particular services you would have to buy the same software.

I was perhaps most impressed with the three Marble modems, considering the high level of software support from TM. We'll be looking in future issues at some of the services you can access with a modem, and that may help to make the choice of product easier. ■





5087 DATA 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0  
 5088 DATA 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0  
 5089 DATA 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0  
 5090 DATA 0, 0, 0, 0, 16, 16, 16, 16, 16, 16, 16, 16, 16, 0  
 5091 DATA 00, 200, 0, 0, 0, 0, 0, 0, 0, 240, 16, 16, 16, 16  
 5092 DATA 0, 0, 0, 31, 16, 16, 16, 16, 16, 16, 16, 240, 0, 0  
 5093 DATA 00, 16, 16, 16, 16, 31, 0, 0, 0, 0, 160, 60, 200  
 5094 DATA 60, 160, 0, 0, 0, 0, 0, 0, 0, 0, 0, 200, 120  
 5095 DATA 120, 120, 120, 120, 120, 120, 200, 200, 140, 160, 160, 160, 160, 200  
 5096 DATA 170, 170, 40, 160, 7, 200, 100, 100, 40, 200, 120, 170, 40, 200  
 5097 DATA 200, 240, 160, 160, 40, 0, 170, 170, 40, 160, 0, 200, 100, 170  
 5098 DATA 40, 200, 150, 190, 40, 200, 224, 7, 200, 240, 140, 100, 40, 0  
 5099 DATA 160, 7, 100, 170, 40, 40, 100, 170, 40, 40, 150, 170, 40, 200  
 5100 DATA 16, 240, 0, 160, 7, 100, 190, 40, 100, 100, 100, 170, 40, 100, 150  
 5101 DATA 190, 40, 200, 16, 240, 0, 140, 100, 0, 64, 64, 64, 64, 64  
 5102 DATA 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64  
 5103 DATA 64, 64, 140, 64, 0, 64, 64, 64, 64, 64, 64, 64, 64, 64  
 5104 DATA 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 140, 64  
 5105 DATA 64, 154, 216, 220, 220, 220, 220, 220, 220, 220, 220, 220, 220, 220  
 5106 DATA 220, 220, 220, 220, 220, 220, 220, 220, 220, 210, 140, 100, 64, 64  
 5107 DATA 154, 0, 30, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00  
 5108 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 154, 0, 140, 100, 64  
 5109 DATA 64, 154, 0, 30, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00  
 5110 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 154, 0, 30, 30  
 5111 DATA 30, 30, 120, 00, 70, 60, 30, 0, 40, 50, 00, 70, 140, 100  
 5112 DATA 64, 64, 154, 0, 30, 00, 00, 00, 00, 00, 00, 00, 154, 0, 140  
 5113 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 154, 0, 140  
 5114 DATA 150, 64, 64, 154, 0, 30, 00, 00, 00, 00, 00, 00, 00, 00  
 5115 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 154, 0  
 5116 DATA 30, 30, 30, 30, 30, 120, 00, 60, 60, 60, 60, 70, 140, 100  
 5117 DATA 64, 64, 154, 0, 30, 00, 00, 00, 00, 00, 00, 00, 00, 00  
 5118 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 154, 0, 140  
 5119 DATA 150, 64, 64, 154, 0, 30, 00, 00, 00, 00, 00, 00, 00, 00  
 5120 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 154, 0  
 5121 DATA 140, 100, 64, 64, 154, 0, 30, 00, 00, 00, 00, 00, 00, 00  
 5122 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 154  
 5123 DATA 00, 140, 100, 64, 64, 154, 0, 30, 00, 00, 00, 00, 00, 00  
 5124 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00  
 5125 DATA 154, 0, 30, 30, 30, 30, 30, 30, 30, 154, 60, 60, 100, 140  
 5126 DATA 150, 64, 64, 154, 0, 30, 00, 00, 00, 00, 00, 00, 00, 00  
 5127 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 154, 0  
 5128 DATA 30, 30, 30, 30, 30, 30, 150, 174, 170, 100, 100, 140, 100, 64  
 5129 DATA 64, 154, 0, 30, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00  
 5130 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 154, 0, 30, 30  
 5131 DATA 30, 30, 30, 30, 154, 100, 100, 200, 200, 140, 100, 64, 64  
 5132 DATA 154, 0, 30, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00  
 5133 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 154, 0, 30, 30  
 5134 DATA 30, 30, 30, 100, 200, 200, 200, 200, 200, 140, 100, 64, 64, 154  
 5135 DATA 0, 30, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00  
 5136 DATA 00, 00, 00, 00, 00, 00, 00, 154, 0, 140, 100, 64, 64  
 5137 DATA 154, 0, 300, 300, 300, 300, 300, 300, 300, 300, 300, 300, 300, 300  
 5138 DATA 200, 300, 300, 300, 300, 300, 300, 300, 300, 140, 30, 100, 60, 100  
 5139 DATA 0, 100, 0, 60, 70, 00, 60, 154, 200, 0, 40, 60, 64, 154  
 5140 DATA 200, 300, 300, 150, 64, 70, 70, 60, 154, 200, 0, 60, 60, 60  
 5141 DATA 100, 0, 140, 30, 30, 154, 200, 300, 300, 300, 300, 300, 300, 300  
 5142 DATA 200, 300, 300, 300, 300, 300, 300, 300, 300, 300, 300, 300, 300  
 5143 DATA 140, 17, 17, 17, 30, 30, 30, 30, 30, 30, 30, 30, 30  
 5144 DATA 30, 30, 30, 150, 60, 250, 300, 64, 17, 150, 30, 150, 150, 30  
 5145 DATA 30, 140, 140, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30  
 5146 DATA 30, 30, 30, 30, 30, 30, 30, 30, 17, 150, 150, 150, 30, 0  
 5147 DATA 0, 0, 17, 150, 150, 150, 0, 30, 0, 17, 150, 150, 150, 0  
 5148 DATA 64, 0, 17, 150, 150, 150, 100, 64, 64, 64, 17, 160, 0  
 5149 DATA 140, 60, 0, 160, 0, 140, 30, 0, 160, 110, 140, 60, 0, 140  
 5150 DATA 0, 200, 160, 60, 140, 0, 200, 160, 200, 140, 200, 160, 200, 160  
 5151 DATA 140, 60, 0, 140, 0, 200, 160, 160, 140, 0, 200, 160, 200, 140  
 5152 DATA 200, 7, 160, 100, 140, 64, 0, 160, 0, 140, 70, 0, 160, 0  
 5153 DATA 140, 60, 0, 170, 60, 1, 300, 300, 11, 200, 0, 160, 2, 140  
 5154 DATA 00, 0, 140, 30, 200, 170, 64, 0, 140, 240, 7, 30, 100, 200



```

26 POKE=32410:385787-2
27 POKE34273,200-R:POKE34284,R:POKE34294,R:NEXT
48 POKE33288,1:POKE33289,1
98 SC=R:POKE342,8:POKE343,8:R#R:SCORE
92 POKE344,133:POKE345,7:R#R:TIME
188 SYS44853
118 SC=PEEK(14731)-480+388+PEEK(14741)-481+18+PEEK(14751)-48
115 POKE33289,8
128 PRINTCHR(147):SPC(128)*"YOUR SCORE WAS"SC
132 PRINTSPC(98)*"THE HS SCORE WAS"HS
124 1P#1:GOTOHP:PRINTSPC(128)*"YOU HAVE THE NEW HS SCORE OF"SC:HS=SC
135 POKE=370:377:385:393:397:405:413:421:429:437:445:453:461:469:477:485:493:501:509:517:525:533:541:549:557:565:573:581:589:597:605:613:621:629:637:645:653:661:669:677:685:693:701:709:717:725:733:741:749:757:765:773:781:789:797:805:813:821:829:837:845:853:861:869:877:885:893:901:909:917:925:933:941:949:957:965:973:981:989:997:1005:1013:1021:1029:1037:1045:1053:1061:1069:1077:1085:1093:1101:1109:1117:1125:1133:1141:1149:1157:1165:1173:1181:1189:1197:1205:1213:1221:1229:1237:1245:1253:1261:1269:1277:1285:1293:1301:1309:1317:1325:1333:1341:1349:1357:1365:1373:1381:1389:1397:1405:1413:1421:1429:1437:1445:1453:1461:1469:1477:1485:1493:1501:1509:1517:1525:1533:1541:1549:1557:1565:1573:1581:1589:1597:1605:1613:1621:1629:1637:1645:1653:1661:1669:1677:1685:1693:1701:1709:1717:1725:1733:1741:1749:1757:1765:1773:1781:1789:1797:1805:1813:1821:1829:1837:1845:1853:1861:1869:1877:1885:1893:1901:1909:1917:1925:1933:1941:1949:1957:1965:1973:1981:1989:1997:2005:2013:2021:2029:2037:2045:2053:2061:2069:2077:2085:2093:2101:2109:2117:2125:2133:2141:2149:2157:2165:2173:2181:2189:2197:2205:2213:2221:2229:2237:2245:2253:2261:2269:2277:2285:2293:2301:2309:2317:2325:2333:2341:2349:2357:2365:2373:2381:2389:2397:2405:2413:2421:2429:2437:2445:2453:2461:2469:2477:2485:2493:2501:2509:2517:2525:2533:2541:2549:2557:2565:2573:2581:2589:2597:2605:2613:2621:2629:2637:2645:2653:2661:2669:2677:2685:2693:2701:2709:2717:2725:2733:2741:2749:2757:2765:2773:2781:2789:2797:2805:2813:2821:2829:2837:2845:2853:2861:2869:2877:2885:2893:2901:2909:2917:2925:2933:2941:2949:2957:2965:2973:2981:2989:2997:3005:3013:3021:3029:3037:3045:3053:3061:3069:3077:3085:3093:3101:3109:3117:3125:3133:3141:3149:3157:3165:3173:3181:3189:3197:3205:3213:3221:3229:3237:3245:3253:3261:3269:3277:3285:3293:3301:3309:3317:3325:3333:3341:3349:3357:3365:3373:3381:3389:3397:3405:3413:3421:3429:3437:3445:3453:3461:3469:3477:3485:3493:3501:3509:3517:3525:3533:3541:3549:3557:3565:3573:3581:3589:3597:3605:3613:3621:3629:3637:3645:3653:3661:3669:3677:3685:3693:3701:3709:3717:3725:3733:3741:3749:3757:3765:3773:3781:3789:3797:3805:3813:3821:3829:3837:3845:3853:3861:3869:3877:3885:3893:3901:3909:3917:3925:3933:3941:3949:3957:3965:3973:3981:3989:3997:4005:4013:4021:4029:4037:4045:4053:4061:4069:4077:4085:4093:4101:4109:4117:4125:4133:4141:4149:4157:4165:4173:4181:4189:4197:4205:4213:4221:4229:4237:4245:4253:4261:4269:4277:4285:4293:4301:4309:4317:4325:4333:4341:4349:4357:4365:4373:4381:4389:4397:4405:4413:4421:4429:4437:4445:4453:4461:4469:4477:4485:4493:4501:4509:4517:4525:4533:4541:4549:4557:4565:4573:4581:4589:4597:4605:4613:4621:4629:4637:4645:4653:4661:4669:4677:4685:4693:4701:4709:4717:4725:4733:4741:4749:4757:4765:4773:4781:4789:4797:4805:4813:4821:4829:4837:4845:4853:4861:4869:4877:4885:4893:4901:4909:4917:4925:4933:4941:4949:4957:4965:4973:4981:4989:4997:5005:5013:5021:5029:5037:5045:5053:5061:5069:5077:5085:5093:5101:5109:5117:5125:5133:5141:5149:5157:5165:5173:5181:5189:5197:5205:5213:5221:5229:5237:5245:5253:5261:5269:5277:5285:5293:5301:5309:5317:5325:5333:5341:5349:5357:5365:5373:5381:5389:5397:5405:5413:5421:5429:5437:5445:5453:5461:5469:5477:5485:5493:5501:5509:5517:5525:5533:5541:5549:5557:5565:5573:5581:5589:5597:5605:5613:5621:5629:5637:5645:5653:5661:5669:5677:5685:5693:5701:5709:5717:5725:5733:5741:5749:5757:5765:5773:5781:5789:5797:5805:5813:5821:5829:5837:5845:5853:5861:5869:5877:5885:5893:5901:5909:5917:5925:5933:5941:5949:5957:5965:5973:5981:5989:5997:6005:6013:6021:6029:6037:6045:6053:6061:6069:6077:6085:6093:6101:6109:6117:6125:6133:6141:6149:6157:6165:6173:6181:6189:6197:6205:6213:6221:6229:6237:6245:6253:6261:6269:6277:6285:6293:6301:6309:6317:6325:6333:6341:6349:6357:6365:6373:6381:6389:6397:6405:6413:6421:6429:6437:6445:6453:6461:6469:6477:6485:6493:6501:6509:6517:6525:6533:6541:6549:6557:6565:6573:6581:6589:6597:6605:6613:6621:6629:6637:6645:6653:6661:6669:6677:6685:6693:6701:6709:6717:6725:6733:6741:6749:6757:6765:6773:6781:6789:6797:6805:6813:6821:6829:6837:6845:6853:6861:6869:6877:6885:6893:6901:6909:6917:6925:6933:6941:6949:6957:6965:6973:6981:6989:6997:7005:7013:7021:7029:7037:7045:7053:7061:7069:7077:7085:7093:7101:7109:7117:7125:7133:7141:7149:7157:7165:7173:7181:7189:7197:7205:7213:7221:7229:7237:7245:7253:7261:7269:7277:7285:7293:7301:7309:7317:7325:7333:7341:7349:7357:7365:7373:7381:7389:7397:7405:7413:7421:7429:7437:7445:7453:7461:7469:7477:7485:7493:7501:7509:7517:7525:7533:7541:7549:7557:7565:7573:7581:7589:7597:7605:7613:7621:7629:7637:7645:7653:7661:7669:7677:7685:7693:7701:7709:7717:7725:7733:7741:7749:7757:7765:7773:7781:7789:7797:7805:7813:7821:7829:7837:7845:7853:7861:7869:7877:7885:7893:7901:7909:7917:7925:7933:7941:7949:7957:7965:7973:7981:7989:7997:8005:8013:8021:8029:8037:8045:8053:8061:8069:8077:8085:8093:8101:8109:8117:8125:8133:8141:8149:8157:8165:8173:8181:8189:8197:8205:8213:8221:8229:8237:8245:8253:8261:8269:8277:8285:8293:8301:8309:8317:8325:8333:8341:8349:8357:8365:8373:8381:8389:8397:8405:8413:8421:8429:8437:8445:8453:8461:8469:8477:8485:8493:8501:8509:8517:8525:8533:8541:8549:8557:8565:8573:8581:8589:8597:8605:8613:8621:8629:8637:8645:8653:8661:8669:8677:8685:8693:8701:8709:8717:8725:8733:8741:8749:8757:8765:8773:8781:8789:8797:8805:8813:8821:8829:8837:8845:8853:8861:8869:8877:8885:8893:8901:8909:8917:8925:8933:8941:8949:8957:8965:8973:8981:8989:8997:9005:9013:9021:9029:9037:9045:9053:9061:9069:9077:9085:9093:9101:9109:9117:9125:9133:9141:9149:9157:9165:9173:9181:9189:9197:9205:9213:9221:9229:9237:9245:9253:9261:9269:9277:9285:9293:9301:9309:9317:9325:9333:9341:9349:9357:9365:9373:9381:9389:9397:9405:9413:9421:9429:9437:9445:9453:9461:9469:9477:9485:9493:9501:9509:9517:9525:9533:9541:9549:9557:9565:9573:9581:9589:9597:9605:9613:9621:9629:9637:9645:9653:9661:9669:9677:9685:9693:9701:9709:9717:9725:9733:9741:9749:9757:9765:9773:9781:9789:9797:9805:9813:9821:9829:9837:9845:9853:9861:9869:9877:9885:9893:9901:9909:9917:9925:9933:9941:9949:9957:9965:9973:9981:9989:9997:10005:10013:10021:10029:10037:10045:10053:10061:10069:10077:10085:10093:10101:10109:10117:10125:10133:10141:10149:10157:10165:10173:10181:10189:10197:10205:10213:10221:10229:10237:10245:10253:10261:10269:10277:10285:10293:10301:10309:10317:10325:10333:10341:10349:10357:10365:10373:10381:10389:10397:10405:10413:10421:10429:10437:10445:10453:10461:10469:10477:10485:10493:10501:10509:10517:10525:10533:10541:10549:10557:10565:10573:10581:10589:10597:10605:10613:10621:10629:10637:10645:10653:10661:10669:10677:10685:10693:10701:10709:10717:10725:10733:10741:10749:10757:10765:10773:10781:10789:10797:10805:10813:10821:10829:10837:10845:10853:10861:10869:10877:10885:10893:10901:10909:10917:10925:10933:10941:10949:10957:10965:10973:10981:10989:10997:11005:11013:11021:11029:11037:11045:11053:11061:11069:11077:11085:11093:11101:11109:11117:11125:11133:11141:11149:11157:11165:11173:11181:11189:11197:11205:11213:11221:11229:11237:11245:11253:11261:11269:11277:11285:11293:11301:11309:11317:11325:11333:11341:11349:11357:11365:11373:11381:11389:11397:11405:11413:11421:11429:11437:11445:11453:11461:11469:11477:11485:11493:11501:11509:11517:11525:11533:11541:11549:11557:11565:11573:11581:11589:11597:11605:11613:11621:11629:11637:11645:11653:11661:11669:11677:11685:11693:11701:11709:11717:11725:11733:11741:11749:11757:11765:11773:11781:11789:11797:11805:11813:11821:11829:11837:11845:11853:11861:11869:11877:11885:11893:11901:11909:11917:11925:11933:11941:11949:11957:11965:11973:11981:11989:11997:12005:12013:12021:12029:12037:12045:12053:12061:12069:12077:12085:12093:12101:12109:12117:12125:12133:12141:12149:12157:12165:12173:12181:12189:12197:12205:12213:12221:12229:12237:12245:12253:12261:12269:12277:12285:12293:12301:12309:12317:12325:12333:12341:12349:12357:12365:12373:12381:12389:12397:12405:12413:12421:12429:12437:12445:12453:12461:12469:12477:12485:12493:12501:12509:12517:12525:12533:12541:12549:12557:12565:12573:12581:12589:12597:12605:12613:12621:12629:12637:12645:12653:12661:12669:12677:12685:12693:12701:12709:12717:12725:12733:12741:12749:12757:12765:12773:12781:12789:12797:12805:12813:12821:12829:12837:12845:12853:12861:12869:12877:12885:12893:12901:12909:12917:12925:12933:12941:12949:12957:12965:12973:12981:12989:12997:13005:13013:13021:13029:13037:13045:13053:13061:13069:13077:13085:13093:13101:13109:13117:13125:13133:13141:13149:13157:13165:13173:13181:13189:13197:13205:13213:13221:13229:13237:13245:13253:13261:13269:13277:13285:13293:13301:13309:13317:13325:13333:13341:13349:13357:13365:13373:13381:13389:13397:13405:13413:13421:13429:13437:13445:13453:13461:13469:13477:13485:13493:13501:13509:13517:13525:13533:13541:13549:13557:13565:13573:13581:13589:13597:13605:13613:13621:13629:13637:13645:13653:13661:13669:13677:13685:13693:13701:13709:13717:13725:13733:13741:13749:13757:13765:13773:13781:13789:13797:13805:13813:13821:13829:13837:13845:13853:13861:13869:13877:13885:13893:13901:13909:13917:13925:13933:13941:13949:13957:13965:13973:13981:13989:13997:14005:14013:14021:14029:14037:14045:14053:14061:14069:14077:14085:14093:14101:14109:14117:14125:14133:14141:14149:14157:14165:14173:14181:14189:14197:14205:14213:14221:14229:14237:14245:14253:14261:14269:14277:14285:14293:14301:14309:14317:14325:14333:14341:14349:14357:14365:14373:14381:14389:14397:14405:14413:14421:14429:14437:14445:14453:14461:14469:14477:14485:14493:14501:14509:14517:14525:14533:14541:14549:14557:14565:14573:14581:14589:14597:14605:14613:14621:14629:14637:14645:14653:14661:14669:14677:14685:14693:14701:14709:14717:14725:14733:14741:14749:14757:14765:14773:14781:14789:14797:14805:14813:14821:14829:14837:14845:14853:14861:14869:14877:14885:14893:14901:14909:14917:14925:14933:14941:14949:14957:14965:14973:14981:14989:14997:15005:15013:15021:15029:15037:15045:15053:15061:15069:15077:15085:15093:15101:15109:15117:15125:15133:15141:15149:15157:15165:15173:15181:15189:15197:15205:15213:15221:15229:15237:15245:15253:15261:15269:15277:15285:15293:15301:15309:15317:15325:15333:15341:15349:15357:15365:15373:15381:15389:15397:15405:15413:15421:15429:15437:15445:15453:15461:15469:15477:15485:15493:15501:15509:15517:15525:15533:15541:15549:15557:15565:15573:15581:15589:15597:15605:15613:15621:15629:15637:15645:15653:15661:15669:15677:15685:15693:15701:15709:15717:15725:15733:15741:15749:15757:15765:15773:15781:15789:15797:15805:15813:15821:15829:15837:15845:15853:15861:15869:15877:15885:15893:15901:15909:15917:15925:15933:15941:15949:15957:15965:15973:15981:15989:15997:16005:16013:16021:16029:16037:16045:16053:16061:16069:16077:16085:16093:16101:16109:16117:16125:16133:16141:16149:16157:16165:16173:16181:16189:16197:16205:16213:16221:16229:16237:16245:16253:16261:16269:16277:16285:16293:16301:16309:16317:16325:16333:16341:16349:16357:16365:16373:16381:16389:16397:16405:16413:16421:16429:16437:16445:16453:16461:16469:16477:16485:16493:16501:16509:16517:16525:16533:16541:16549:16557:16565:16573:16581:16589:16597:16605:16613:16621:16629:16637:16645:16653:16661:16669:16677:16685:16693:16701:16709:16717:16725:16733:16741:16749:16757:16765:16773:16781:16789:16797:16805:16813:16821:16829:16837:16845:16853:16861:16869:16877:16885:16893:16901:16909:16917:16925:16933:16941:16949:16957:16965:16973:16981:16989:16997:17005:17013:17021:17029:17037:17045:17053:17061:17069:17077:17085:17093:17101:17109:17117:17125:17133:17141:17149:17157:17165:17173:17181:17189:17197:17205:17213:17221:17229:17237:17245:17253:17261:17269:17277:17285:17293:17301:17309:17317:17325:17333:17341:17349:17357:17365:17373:17381:17389:17397:17405:17413:17421:17429:17437:17445:17453:17461:17469:17477:17485:17493:17501:17509:17517:17525:17533:17541:17549:17557:17565:17573:17581:17589:17597:17605:17613:17621:17629:17637:17645:17653:17661:17669:17677:17685:17693:17701:17709:17717:17725:17733:17741:17749:17757:17765:17773:17781:17789:17797:17805:17813:17821:17829:17837:17845:17853:17861:17869:17877:17885:17893:17901:17909:17917:17925:17933:17941:17949:17957:17965:17973:17981:17989:17997:18005:18013:18021:18029:18037:18045:18053:18061:18069:18077:18085:18093:18101:18109:18117:18125:18133:18141:18149:18157:1816
```



# Make sense of sorting methods

*N Gregory deals with 64 data-sorting problems.*

IF YOU HAVE ever wanted to program your 64-bit sort data, alphabetically or numerically, but haven't found any way to go about it, I hope this article will be of some help. The program, SORT DEMO, is a BASIC direct demonstration of data different sorting routines which will sort the data you have entered, giving at the end of the sort the way the routine took to execute. This data should be used as a guide only, and not as a law, because it does not take into account the time taken for the program to find the numbers, and so the routines are not on top of the other data may be significant.

SORT DEMO is not a very useful program on its own. It would be useful to be able to use SORT DEMO to illustrate the routines, and a couple of other things like using the FUNCTION key, instead of just giving the routines to solution.

Any program which sorts data must first be given that data. How you go about this depends on your program; you can use DATA statements in the program, then, use input via INPUT, or read the data in a disk or tape file. Whichever method you use, you should know two things. Firstly you should have some idea how many pieces of data you are going to enter so that you can DIMENSION that array which will hold your data. The second thing is to want your data as it is entered, so that at the end of the input you know exactly how much data is in the array. The only reason that there are two pieces of DATA for example. Once you have entered the number of elements read, it is a good idea to keep the information safe. I would suggest that you store the value in the first element of the array, then in element 25580.

By doing this you will always know where the information is, and it can be copied on tape or disk as part of the array. All you need to do when reading the array back is use lines such as:

```
40 INPUT L, L, TEMPS
50 NUMBER = VAL(TEMPS)
60 DIM ARRAY(NUMBER)
70 ARRAY() = TEMPS
75 FOR INDEX = 1 TO NUMBER
80 INPUT L, L, ARRAY(INDEX)
90 NEXT INDEX
```

Using this technique you can use the data in other programs without having to worry about how much data is in the file.

To show you how you can sort arrays, type in SORT DEMO. One thing you must do is add a few more DATA statements otherwise the program will not work properly. To do this all you have to do is type in line two as it is listed, followed by lines two and three. Once you have entered line 1 (and pressed RETURN) go back over the line number and change it to a 4, then a 1 and so on. Remember to press RETURN for each line. I suggest you enter at least 20

more lines because you will then get a good idea of the speed of each routine. When you have done this change the variable at line 110, MAX, to equal the number of data statements you have, not counting line 1. You can now construct typing in the program, when you're finished SAVE it before you RUN it.

When run, SORT DEMO first asks you to input words to be sorted. These should be a maximum of 14 characters long, and should be finished with the END of DATA statement (":"). The limit on word length is not imposed by the sorting routines themselves, but by the DATA statements at the beginning of the program. Because each line has 14 characters in it (you typed them in, so I hope they haven't) then leaves enough room for a 14 character word and two inverted commas (""). The only reason for this was that I didn't want you to type the word but in every line you need the program.

After you have finished entering the words you are asked to REVERSE the program. Again this is only on stop you

```
1 DATA "0" REM DATA FLAG
2 DATA ..... REM 16 COPIES
3 DATA .....
4 REM ADD MORE DATA STATEMENTS FROM HERE (SAME AS LINE 2 & 3)
100
110 MAX=2 REM SET MAX TO NUMBER OF DATA STATEMENTS
115 POKES0200=15 POKES0200=15
120 PRINTCHR$(14) REM LOWER CASE CHARACTERS
125 DIM SORTA( MAX ), HOLD( MAX ), INDEX( MAX ) REM RESERVE MEMORY
130 GOSUB 500 REM BUILD CLUSTER POSITION ARRAYS
135 READ FLAG REM DATA FLAG
140 IF VAL(FLAG)=1 THEN GOSUB 600
145 PRINT "0" REM CLR
150 GOSUB 700 REM READ DATA STATEMENTS
155 GOSUB 740 REM READ TEXT
160 SET ANS(0)=ANS(0)+ANS(0)+CHR$(0)
165 IF ANS(ANS(0))=64 THEN END
170 ON ANS(ANS(ANS(0))-50) GOSUB 700,100,270,440
175 GOTO 160
180 REM ..... BUBBLE SORT .....
185 FLAG="1" REM "1"
190 PRINT PWT(STR$(12)*" " _ 1 _ 1 _ 1) REM "SORTED"
195 FLAG="000000" REM SET INTERNAL CLOCK
200 INDEX=1 FLAG=0
205 IF SORTA(INDEX)=SORTA(INDEX+1) THEN 230
210 TEMPS=SORTA(INDEX)
215 SORTA(INDEX)=SORTA(INDEX+1)
220 SORTA(INDEX+1)=TEMPS
225 FLAG=1
230 INDEX=INDEX+1
```

*Continued on page 28*



You shot  
my rapids.  
I shook

NOW  
AVAILABLE

# CLIFF HANGER

AUTHOR - JAMES DAY ORIGINAL MUSIC - BRIAN DOE

Thrill to the cartoon style action of *Cliff Hanger*, a really original, 'Wild West' game. As Cliff the hero, you've got to stop the bandits shooting up the canyon. But with its own brand of wacky cartoon action fun, things simply aren't as they seem in *Cliff Hanger*. For a start, the boulder you throw at the ol' bandits may just come bouncing back at you.

*Cliff Hanger* incorporates all the elements that have made New Generation games best sellers for the Spectrum, such as original ideas, superb graphics and hilarious happenings - but now it's available first for the Commodore 64. Featuring 30 separate screens, three levels of difficulty, one or two players scoring, Hall of Fame and joystick compatibility or your defined keys, *Cliff Hanger* is set to be THE Commodore games playing sensation. Available from any good software store for just £7.95.

shoota  
ids, then  
ota you!

NOW  
AVAILABLE

# Shoot the Rapids

AUTHOR - PAUL BUNNY

Ever wondered what it would be like to face the fierce white water in a top class canoeist slalom run? Well wonder no more because you can enjoy the fast action thrill of competitive canoeing from the comfort of your own armchair with *Shoot the Rapids*.

It's a game that involves real skill because you must move your joystick to simulate paddling action. You must get through the gates of the slalom course in the fastest time possible, while avoiding the river bank and rocks. There are also extra hazards like rogue-speed boats and interfering beavers to worry about.

This multi level game features increasingly difficult river courses with superb graphics and smooth scrolling along the river. Qualifying times have to be reached to move onto the next course.

With Hall of Fame, one or two player scoring and joystick compatibility, *Shoot the Rapids* is probably the best sports action simulation game devised to date. Available from any good software store for just £7.95.

Generation  
Software

100% computer compatible  
100% joystick compatible  
100% fun



Most Generation products are available on  
other forms of media and hardware at cost

```

235 IF INDEXCOUNT THEN 245
240 IF FLAG=1 THEN 300
245 TX=TI/60 REM GET TIME OF SORT
250 GOSUB 505 REM SHOW SORTED ARRAY
255 GOSUB 740 REM MENU TEXT
260 RETURN
265 REM ----- SHELL SORTER SORT -----
270 TYPE="SHELL SORTER"
275 REM "IMPROVED BY OFFICINER OR DREVID(BY OFFICINER)"
280 POS=0 HT=0 VT=0 GOSUB 15 PRINT "BY OFFICINER OR DREVID(BY OFFICINER)", INPUT HT
285 IF POS<0 THEN 295 THEN POS=1 FOR I=1 TO COUNT INDEX(I)=I NEXT
290 IF POS<0 THEN 295 AND POS=1 FOR I=1 TO COUNT INDEX(I)=I NEXT
295 PRINT PRINTTAB(12," I = 1 2 3 4 5 ")
300 TI="000000" REM SET INTERNAL CLOCK
305 RANGE=COUNT
310 RANGE=INT(RANGE/20) IF RANGE=0 THEN 305
315 INDEX=1
320 FLAG=COUNT-RANGE
325 ELEMENT=INDEX
330 ELEMENT=ELEMENT+RANGE
335 IF POS=1 THEN GOSUB 410 ON PPR GOTO 370,360
340 IF SORT(ELEMENT)>SORT(ELEMENT) THEN 370
345 TEMP=SORT(ELEMENT)
350 SORT(ELEMENT)=SORT(ELEMENT)
355 SORT(ELEMENT)=TEMP
360 ELEMENT=ELEMENT-RANGE
365 IF ELEMENT=1 THEN 330
370 INDEX=INDEX+1
375 IF INDEX>FLAG THEN 300
380 GOTO 325
385 TX=TI/60 REM GET TIME OF SORT
390 GOSUB 505 REM SHOW SORTED ARRAY
395 GOSUB 740 REM MENU TEXT
400 RETURN
405 REM ----- POINTER ONLY -----
410 IF SORT(INDEX(ELEMENT))>SORT(INDEX(ELEMENT)) THEN PPR=1 GOTO 430
415 TEMP=INDEX(ELEMENT)
420 INDEX(ELEMENT)=INDEX(ELEMENT)
425 INDEX(ELEMENT)=TEMP/PPR+2
430 RETURN
435 REM ----- SHUFFLE SORT -----
440 TYPE="SHUFFLE"
445 PRINT PRINTTAB(12," I = 1 2 3 4 5 ")
450 TI="000000" REM SET INTERNAL CLOCK
455 FOR INDEX=1 TO COUNT HOLD=INDEX,00=CHR(1) HOLD=INDEX,1=CHR(1) NEXT
460 HOLD=1,00=CHR(1) P=0 HOLD=1 H(1)=0
465 FOR INDEX=2 TO COUNT
470 IF SORT(INDEX)>SORT(INDEX) THEN P=(P+1)AND1
475 H(P)=INDEX+1
480 HOLD(H(P),P)=SORT(INDEX)
485 NEXT INDEX
490 IF ASC(HOLD(1,1))<0 THEN 500
495 SORT(H(1,1)=CHR(1) HOLD(H(1),1) H(1)=1
500 FOR INDEX = 1 TO COUNT
505 TEMP=SORT(H(1,1)=INDEX-1)
510 IF HOLD(HOLD(1,1)=1) THEN HOLD(H(1),1) GOTO 540
515 IF ASC(HOLD(H(1),1))<0 THEN HOLD(H(1),1) GOTO 545
520 IF HOLD(H(1,1)=TEMP THEN HOLD=1
525 IF HOLD(H(1,1)=TEMP THEN HOLD=2
530 IF HOLD=0 THEN HOLD=3
535 IF HOLD THEN HOLD=2 IF HOLD(HOLD(1,1)=HOLD(H(1,1)) THEN HOLD=1
540 IF HOLD=2 THEN SORT(H(1,1)=HOLD(H(1),1) HOLD(H(1),1) HOLD(H(1,1)
545 IF HOLD=1 THEN SORT(INDEX)=HOLD(H(1,1) HOLD(H(1,1) HOLD(H(1,1)
550 HOLD=0 NEXT INDEX
555 GOTO 455
560 TX=TI/60 REM GET TIME OF SORT
565 GOSUB 505 REM SHOW SORTED ARRAY
570 GOSUB 740 REM MENU TEXT
575 RETURN
580 REM ----- DISPLAY ARRAY -----

```

```

595 P
596 P
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999

```



shaping. One word of warning though, the Commodore only checks to see if a key on the Database is being pressed, not the read/play combination. When the program asks you to PRESS RECORD AND PLAY ON TAPE you should press just that — not the tape reader before you enter the END of DATA character.

After having the revised program, SORT DEMO will present you with the menu, from which you can do one of five things. There are three sort routines, SHUFFLE SORT, SHELL METEOR SORT and SHUFFLE SORT, the facility to overload the data into the output array, and END. You should OVERLOAD the data after each run otherwise you will find the SHUFFLE SORT sorting data in less than a second, something that does not happen in the real world!

Of the three routines I have chosen the SHUFFLE sort as the slowest and simplest. I have included it because it is the last routine for translation into machine code if any of you are brave enough.

The two other routines are a little involved but you should have no such problem working out their logic. The SHELL METEOR sort I have divided into two sections so that the simpler method you may need to sort arrays. Let us suppose you want to sort data in an Address Book type of program. In a program such as this, the elements are that all the data will be linked, that is the names will go with the addresses. Obviously if you just sort the Name file, the Address file may lose all connection to it in the real you are left with an unsorted mass of data.

#### Pointers

You can get round this problem by not sorting the array elements themselves, but sort a set of pointers to the array contents. In this way the contents of the array do not change order and if, for example NAME\$(1) was SMITH and ADDRESS\$(1) was PARADISE at these two slots among the contents of NAME\$(1) and ADDRESS\$(1) would be the same as they were originally. The modification in the SHELL METEOR sort does this. It leaves the contents of the output array alone and sorts pointers which it holds in the array INDEX\$. To distribute this, use the SHELL METEOR sort but answer 'P' when asked if you want to sort. Compare to Pointer (locally answer 'C'). Let the sort run until the line giving the sorted array comes on the screen. Note that the list is not sorted but is in the order that it was READ from the DATA statements. Now enter the program, press RETURN, and type FOR N=1 TO COUNT: PRINT SORTINDEX\$(N): NEXT N

You will now see a sorted list being printed. If you want to show the list down just press the TAB key.

This method brings me on to an aspect of computing which is outside the scope of this article, that of Garbage Collection. Garbage Collection is one of those things which is going to happen to you sooner or later — rather like a hot crash. You will get garbage problems if you store a lot of STRING data about, perhaps it is after all

just another way of saying need storage. Unfortunately there are few programs better at moving strings and creating garbage, than string processors. You may have not come across this problem yet, probably because the Commodore's memory is so extensive, but if your program has slowed up for no apparent reason then that's probably garbage collection going on.

One of the best ways to avoid the time delay in garbage collection is not to use STRING statements at all which, if you remember is what the modification to the SHELL METEOR does. It shifts variables, which are a totally different thing altogether.

If you do find you are having Garbage problems with a program you are writing, they try one of these remedies (you don't get these problems with SORT DEMO normally).

1 Try to use index sorting, as demonstrated.

2 If all of the strings you don't need and have a garbage collection with the statement GARBAGE=FREE(3).

3 If you still have data and then do a CLR. This may be a bit drastic but sometimes garbage can take 30 minutes to clear in the worst case.

The two things SORT DEMO doesn't do are:

1 How to limit the sort to a specified number of elements — the old KEY to How to sort numeric data. Both of these problems are easily got round. The fix can be solved by using the string-shipping commands of BASIC and replacing any comparative statements, for instance

```
IF SORTINDEX$(N) <= SORTS
  INDEX$(N+1) = INDEX$(N)
  IF SORTINDEX$(INDEX$(N),KEY) <=
    SORTINDEX$(INDEX$(N+1),KEY) THEN
    GO TO
```

where KEY is the number of characters you want to consider in the sort.

#### Sorting

Sorting numbers can be done by putting the TAB function into the array increment but, as I have mentioned, string processors have garbage collection problems. If you know your list of data is going to be numbers, then write your routine to handle numbers. It's the same as the routine for Strings but use floating point of integer arrays, not string arrays.

Finally, because I wanted you to discuss the SORT DEMO program so that you can see the comments in it for your own programs here is a list of the variables and, finally, what they do. ■

## List of variables

<b>SORTS</b>	How many items to be sorted.	<b>INDEX\$</b>	The array holds the sorted pointers when you sort by pointers.
<b>TYPE\$</b>	This is the type of sort routine being used, the variable is used to name the sort when the array is displayed.	<b>RANGE</b>	This is the range over which I elements in the array are compared — it goes between each line through.
<b>YES</b>	This is the Commodore BASIC command variable to read/write to the piffy disk.	<b>FLAG</b>	This variable marks the end of the RANGE.
<b>DEMO\$</b>	Used inside routines to hold temporary strings.	<b>DELIMIT\$</b>	DELIMIT\$ There are two elements in the array which are being compared.
<b>COUNT</b>	The number of elements in the array SORTS.	<b>SHUFFLE SORT</b>	
<b>YES</b>	The reading of the piffy disk decided by YES. This gives the result to accounts for 60% of a second.	<b>HOLDS</b>	This array holds two sets of data. The data is SHUFFLED up in this array depending on how it compares with the previous pass of data put in to HOLDS.
<b>NAME\$</b>	The number of DATA statements before the number statements passed of data to go into SORTS.	<b>F</b>	This variable is used to switch between the 2 elements of HOLDS. The expression F=(F+1) AND 1 makes F go between 0 and 1 each time the expression is encountered.
<b>HT &amp; Y\$</b>	Cursor positioning variables which are linked to the arrays HT\$ & Y\$ which contain cursor movement characters.	<b>N</b>	The 2 elements of the array contain the temporary number of moves into each direction of HOLDS.
<b>SHUFFLE SORT</b>		<b>SP%</b>	This is used to tell the routine the result of the comparison between HOLDS and SORTS. It then shows how the array elements of SORTS is to be filled.
<b>FLAG</b>	This variable equals one if any strings are moved. Only when all the strings are in order will FLAG stay zero during a pass through the array.	<b>100 &amp; 100</b>	These 2 variables keep count of which element in HOLDS the program has to consider.
<b>INDEX</b>	This is a normal variable here. It is set to the element of the array being considered.		
<b>SHELL METEOR SORT</b>			
<b>PP%</b>	This variable equals one if you choose to sort by pointers rather than contents.		
<b>PP%</b>	This returns the routine after a pointer is sorted.		



# VIZASTAR 64

## THE INFORMATION PROCESSOR

■ Spreadsheet

■ Database

■ Graphics

- Personalise your information files and include them into the worksheets for fast, powerful calculations and easy reporting
- Access the screen design of your information records

- One word menu lists the easy selection of facilities
- The high-resolution graphics feature the modulation proving an easy format display

- 5 1000 Row by 84 Column wide area allows with lower memory capacity and efficient usage
- Extensive use of Windows allows you to view and partition the main screen while working on another

- Add or remove items from your records without having to re-inputted your existing information records
- Records up to 1,000 characters long with each entry up to 100 characters

- Supports virtually any printer (IBM, Epson and others, CALVETTS) and many others
- Parallel printers require ONLY a few operations

- Includes information directly into the Visalook from VisiOffice and almost any other system
- Simultaneous display of words about selection or bar graphs

- Advanced spreadsheet features include individual records column widths, proportional data, a print queueing facility plus a wide range of other features

- Worksheet capabilities lets you Search, Sort, Copy/Paste, Delete and Insert by row entries in a range
- The working language for letters, memos, report headings etc.

VisaStar integrates three important electronic aids to your business or home office.

A fast and easy-to-use package - VisaStar is a comprehensive information processor that includes an electronic worksheet, information filing system and simultaneous on-screen graphics.

VisaStar has been designed to incorporate the very latest in user-friendliness - so now you can handle your all-important information in many new ways and in a quick and effective manner.

The information filing capabilities of VisaStar enable you to store your information onto disk in

an ordered and instantly retrievable form. This means that you can quickly pick out individual or entire groups of related information to create lists, statements, labels or reports.

VisaStar is the ONLY program of its kind on the Commodore 64. Completely consistent with the VisiWrite word processor, VisaStar provides a totally comprehensive office system.

VisaStar costs just £99.95 (incl. VAT) from your computer dealer and selected stores. Please write for more details and the name and address of your nearest dealer.



VISA SOFTWARE, 9 MANSION ROW,  
BROMPTON, GILLINGHAM, KENT ME7 5SE  
TEL: MEDWAY (0634) 813780

Dealer enquiries welcome

SOFTWARE

AVAILABLE NOW VIZASTAR 64  
**£99.95**  
(inc VAT)



# TOWER OF ADVENTURE

## Is this a dagger I see before me. . . ?

*Wicked Witch of the West Barbara Conway is inspired by Eureka!, cut up about Macbeth and abetted by Alan*

ADVENTURE games are always exciting new and varied experiences, but even the most imaginative of us could hardly complain on this score when it comes to the remarkable *Barbarians* package offered by Datacube. No less than 10 games, five scenarios and five quests, craved unto one tape and so easy the challenge alone isn't enough, there's a £20,000 prize awaiting the first subscribers to solve the lot.

This is a massive quest, ranging from prehistoric to modern times with the sun being to track down the five missing pieces of the Temporal Tapestry, an alien artifact without which the moon will disintegrate and take the earth with it. Each piece has ended up on a different time sector and, if you don't solve each puzzle correctly you could be stuck in that universe all of them are fraught with monstrous perils that is NOT a good idea. But to complete matters, the final success is being held for ransom by the villainous Dr Hugo Von Borg who wants to be Emperor of the Earth. Well, isn't he all?

### Ingenious

The introductory scenario, which sets your wacky level in the adventure to come, are nothing very special and, as a hobby arcade player, I could have done without them. But the games themselves are a much more attractive prospect.

Each is illustrated with swift, well drawn graphics windows of varying size and with some scenes animated, such as the attack of an aggressive eagle. The scenarios include poisoning parishes, Roman affairs, a German prisoner-of-war camp and the Caribbean pirate, each of which will eventually yield a coded clue for the final adventure. There are some sound effects, good but not spectacular, but the puzzles are impressively constructed and the solutions often rely on a grain of humaneness. You won't figure out how to free Merlin from his rock prison in the Celtic chapter without one!

My ardent imagination insists that I don't have much respect for fights so the

£20,000 is probably safe from me. I suspect that defuncted adventurers who have the same problem get a little 12-year-old to do the arduous games and then make use of the resultant strength together with their wits to solve the rest.

Only another multi-talented game, this time a four-player *Space Macbeth* was produced by Oxford Digital Enterprises



with the backing of the publishers of this magazine, I had assumed this review to be a monument to my fearless independence. Alas for good intentions! Unfortunately, it came out to be a veritable patch of an adventure, complex, witty, with stunning graphics and sound effects and some remarkable documentation (author W Shakespeare, a computer game connoisseur who should go far).

### Disillusion

The games follow the plot of the play closely and the "help" facility gives references to the edited version of the play matched with the two tapes, which you would also have to peruse and/or dispose of thought, although then for I have

been able to achieve only minor successes in winning Macbeth's name spaces.

The games vary from text and graphics, which will change according to whether a scenario has been opened or a required object deposited (don't jump when you hear the very realistic sound effects from what you put on the barbed wire — yick!) through mainly graphics to real-time first-ops for the final confrontation at Doncaster castle.

Some of the time the player is Macbeth, in other adventures you will be Lady or being the sticky domestic chores of living up a hair-raising banquet, providing Lady to discipline your vocal gang and finding something a lot more exotic than the odd pinch of salt to add to a fading meal.

After each game you can visit Sigmund, Kismet's top alchemist and a psychotrist, for a recap which is both entertaining and informative. The fact that this started life as an educational package is obvious, but the final result is an excellent, and tough, adventure game more than capable of holding its own against the commercial competition.

### Secret agent

Another four-part is *The Pridgewood Chronicles*, which is actually two separate adventures, one of them being the previously issued, and successful, *Pridgewood's Diary*. I didn't see the original game but, having heard very well of it, I had high hopes of this package from Eureka! Soft.

They were not quite realised, although a lot of time and credit has obviously gone into the programming and top-out of these games. The first is *Operation Saturn* which contains a seven agent plot with a funny quest. In Part One, which features working first on the attractive screen, resource agents often seemed extraordinarily slow, so much so that I ended to lose interest in the puzzle. The second, however, part is notable for some pleasant animated graphics with the text window in the lower half of the screen. ▶

# MACBETH



4 The "Derry" adventure is more fun, with a varied and often witty scenario, but again emotions can be VERY slow, and I was disappointed with the scope of the vocabulary throughout.

Figure disappointment at the month is probably "Alon", which looks very tempting from the documentation but seems on to be a highly unimaging affair. Despite superb dock charts from the decoded play of the 3d film of the same name and, despite promises of great sophistication from individual personality programs for the core members, all whom you are the commander, playing in systems. After about quarter of an hour, I couldn't give a damn whether the core decided to play the cards or not and was steering on the ship as it descended them.

## Maxwell

Just a few words left for "Great Page", a strange game based on being a newspaper proprietor in a very tight way. Seems to me to be reasonably machine, apart from over-emphasizing the number of books needed in some stories, with most weekly graphic representations of how your paper are doing in readership, income and the likelihood of a government crackdown. You're asked to put a name I picked "Maxwell", choose why early and I'm pleased to say that my day-ship, unimpaired, government building (ag) is now wiping the floor with the more machine competition. Now don't rub it in for you. ■

## For work or play Votlmace has the answer!

**For play:** The delta 3sc joystick is intended for the most sophisticated user. A lightweight unit designed to be hand held and controlled by the fingers of the other hand. The safety slide switches control (or damaged by excess pressure on the joystick) and the fire buttons (choice of three) have been tested for millions of operations.

**For work:** The datapad 16c—padsen way full travel keypad for the CIMA 84. Simply plugs into the two control ports. Complete with a cassette program to define the key functions. In operation just put on the "shift lock" to select keypad.

**DELTA 16c** £29.95  
**DATA 3sc JOYSTICK** £19.95  
 Prices include VAT and P&P

Send cheque or P.O. to:  
**Votlmace Limited**  
 Park Drive  
 Bicknell  
 North  
 SG7 6HW  
 Telephone (0462) 594610

**Votlmace datapad 16c & delta 3sc**

Cables welcome on the Friday—Monday to Friday. Dealer terms available.

# Simple synthesiser software scrutinised

*Chris Whitecombe plays through JMS/Rosett's MIDI music software series*

ALTHOUGH MAKING music using the Commodore 64's SID chip can be rewarding in itself, the true potential of computer and music is better realised using the 64 to control a dedicated music system.

Until recently, the only system able to do this was largely expensive sequencers manufactured by the synthesiser companies, and because such sequencers used different data transmission standards, it wasn't possible to interface machines from different companies.

The interfacers recently released that this sequencer wasn't as that. Forces, and came together to develop a standard which would allow musical instruments from different companies to be linked together. This also opens up the possibility of synchronising control through home computers, of which the most popular is the 64.



Using a MIDI interface between the synthesiser and the 64 creates a new world of musical control through software to be opened up.

The MIDI system has become the new industry standard for connecting synthesisers, not only with computers, but also with other synthesisers and drum machines. It is now possible, using MIDI, to control large numbers of keyboards and drum machines at the touch of a couple of buttons.

## Synthesisers

The system I was shown in by JMS (headquartered by Rosett) and was demonstrated using the Commodore 64 with 1541 Disk Drive. The system's core included a Roland JNR3 306, an Ollie, two Yamaha DX7s (when played) and a Yamaha DX10 (when sustained). The JMS software plays into the unit of the 64 and has a convenience for three cycles. Would you be lucky enough to own more than that, that's sorry. So long as your keyboard has a THREE socket (most have) they can be daisy-chained in much the same way as Disk drives.

Each instrument is assigned a MIDI channel so that it knows what information to extract and what to pass through to the next processor.

If you should happen to be the proud owner of a DX7 (or DX8 for that matter) you will know that it can be a bit fiddly to program sounds into it, as each parameter has to be adjusted individually using the built-in LCD display. With the JMS SOUND EDITOR program, things are made much simpler, as all the sound parameters are displayed on the screen at the same time. Having viewed the sound that you want, you can then store it as data for later retrieval.

## Patches

If you don't want to bother making up your own sounds, then you can buy the SOUND LIBRARY disk which contains 192 pre-programmed "patches" for the DX7.

If the Roland lights on a tape machine make you nervous, resulting in wrong notes everywhere, then the MULTITAKE COMPOSER program is for you. Instead of recording straight to tape, you play "into the computer", which stores all the notes data in memory. This data can then be displayed and stored via the computer keyboard. You can edit pitch, gate time, velocity and sounds, and you can change the tempo without causing a change in the pitch. This means that you can "stretch" (as it were) by playing something slowly and then getting the program to replay it at

the correct speed.

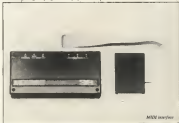
If you own more than one keyboard, and you spend a lot of time recording, mixing and editing then perhaps the 12 TRACK SEQUENCING STUDIO program would help to smooth the way. It offers Real Time recording of 12 polyphonic tracks with simultaneous monitoring of all pre-recorded tracks, analysis of different



tracks (up to 1 track) and, being digital, there is no loss of sound quality when mixing over and over again; editing, deletion and removal of small portions of files is effortless and loading and saving of compositions is quick. Again, you have tempo change without warping of pitch.

## Fastswitch

An ARPEGGIATOR program is available which, when used with a footswitch, enables the player to move and arpeggiate up to 40 chords. Arpeggios can be set to run up, down or cyclic and sequences can be stored on disk.



MIDI interface

But you're something of a Vandal in Mini Windows, then you will, perhaps, have wished that an extra mechanism you had ten pairs of hands and half a dozen heads! Not so much to give more arms to the keyboard, but more to control them between windows. Imagine the scene: you are on stage to face an audience of millions. You finish playing one song, but before the end one you have to change the sounds on all the keyboards. What only do you not have enough time, but you also have to remember where you put the scraps of paper with all the prompts and Piano-roll notes. You use the **MASTER KEYBOARD** program. This last will give you full control of a series of connected keyboards. You simply set up all the sounds in the privacy of your own home in isolation, and let them into a designated area on the Master Keyboard. When on stage, all the sound parameters can be set on all the keyboards at the touch of a button on one single master console.

I was impressed by all the presentations they all worked their tails off, considering their



some specialized material, they are not expensive, coming in from about £40 upwards. The interface itself sells for just under £80 which, again, is not a big consideration for the investor. And it means an

**Abstract**

Now that MIDI has been accepted as the standard, I feel sure that more and more interfaces and programs will become available which will, no doubt, help to drive prices down even more. The failure of computer-aided synthesis books was very evident.

I would like to thank George and Lippmank of Clifford for the designations, and Russell for showing these items. If you want to discuss more about MICH, then contact your local conference.

order to try Capsworld, Reddy Green, Cardiff, London NW6, tel. 01-690 3621, or Rosetta, 315/150 Phil Street, London E17, tel. 01-231 7294. ■

Compendex Plus/Express will be locating all of the new journal software and hardware as it appears. Furthermore, added include ILLIUM Info 1 keyboard, the Bibliographic record sampling system, and products from Bell, Sargent & Greenleaf and Interdoc.

SERIOUS **64** SOFTWARE[illegible]

$\text{I} = \text{Taper}$ ,  $\text{II} = \text{Dipole}$ ,  $\text{III} = \text{Cartridge}$ .  
Measured at 100°C for a total of four half waves.

**PLUS—THE FIRST TONNAGE IS ALL YOURS**

- **PTSD** (post-traumatic stress disorder) can be defined as:
  - PTSD consists of symptoms and distress that:
  - are due to exposure to a traumatic event

**ACCEPTED FOR PUBLICATION** The manuscript described here is not certified as correct or reliable for reproduction.

**64 PLUS** FREEPORT, BLISSVILLE  
NORTON METAL, INC.

## VIC 20 OWNERS!



© 2000 Blackwell Science Ltd, *Journal of Internal Medicine* 247: 105–112

[illegible][illegible][illegible]

# Adventures on the magic network

**Richard Bartle introduces Computer's Multi-User Dungeon, MUD**

WITH THE increasing popularity of adventure and strategy games as opposed to sports extravaganzas, one of the most interesting new ideas in the computer world is MUD — the Multi-User Dungeon.

This is a new kind of adventure game where instead of playing alone, you interact in real time with a number of other players. All your actions influence them, and vice versa, so that if you want to, say, walk into a room and find a sword lying on the ground and two other people in the room, the chances are that one of them will pick up the sword before you do — and very likely attack you with it.

Systems like MUD obviously require bigger computing power than any home micro can manage. In fact the original MUD was programmed on a DEC-VAX miniframe computer at Essex University.

Compendex's Computer system uses a smaller host computer, so it's no problem to find that MUD is now available to Compendex users via their Compendex 84's or host.

## Introducing

The makes it possible for you to play against other Compendex subscribers from hundreds of miles away from you, all through the magic network.

As we've seen in previous articles, Compendex's Computer system comes with one year's subscription to the system for just under £100. Once you've entered the system, MUD can be found using CDDT-HM800 and BUY MUD LINK. This means money to play MUD — charges include £1 per month for membership of the chosen user group, £3 per hour while playing, plus phone charges. It's not cheap.

However, once you're in you can play in the greatest adventure you've ever seen. I'd be more than enthusiastic in my praise of MUD if I hadn't co-written the game, so I'll better not go too far over the top.

The basic fact is that MUDs are just incredibly more fun to play than ordinary adventures. The maximum number of people able to play on the Essex University system was 32, and you used to have to stay up past midnight to get a game into the (pre-4) was in use during the day. Compendex's MUD can be played at any time of day or night, and with up to 34 simultaneous players.

With all those players, MUD gets pretty busy. Although the MUD is not only adventure, the main attractions are the intricate nomenclature, comprehensive



Richard Bartle, author of *Notes on the Game of MUD*

descriptive passages and powerful interaction. You have to keep your wits about you all the time — other players can steal your possessions, or kill you if you look like an easy target.

The objective of the game is to collect treasure and hide them in a temple, thus removing them from the game. Collecting treasure also scores points, and allows you to move up levels. You start as a Novice and finally become a Wizard, endowed with magical powers which enable you to influence the actions of other characters, become invisible and observe the action unnoticed, interact with the course of the game in various mechanical ways, and

informate your will if you are killed using a special passport.

Another feature of MUD is persistence; if you can figure out how to make the invisible bag, or how to transfer the mysterious stones, there are more points to be picked up. It's also possible to play as more than one character, though there are around 40 words on the Essex system, many of them also play as lesser characters too.

MUD, of course, isn't the only game available on Compendex; software can be downloaded and run on your own. 44 Compendex plans to sell around 10,000 modules in the next three months, and although this figure may be optimistic, business users will probably start showing interest later on, once main services become available to suit their needs. Given the popularity of MUD, though, business users might be well advised not to let their employees spend too much time on the machine!

Courtesy Publications, owners of MUD, have plans to release a version as a game for stand-alone computers — it would provide a useful "taster" for those of you who want to see the game before deciding to buy a module.

If you want to find out more about how you can play MUD on the Essex system, contact Richard Bartle, Department of Computer Science, Essex University, Chelmsford, Essex, CM2 8SQ, or phone a six-figure Compendex at Marlowe House, Chipping Street, London W1P 1DP. ■





# COMMODORE SOFTWARE FILE

## Cosmic Bugs

This game for the Commodore VIC comes from Chris Lyon of Liverpool

IN COSMIC BUGS your task is to defend the Earth from invading monsters hovering in the air. The monsters, out of time, drop white bugs on your buildings. These are indestructible, so you can only try to kill as many of the yellow bugs as

possible before the real games.

Use A for left, D for right, and L for fire. There is a short manual onscreen, a score table and a high-score record. You get a bonus test for 1000 points.

```

1 REM COSMIC BUGS
2 REM BUGS S.L.VON V0029
10 V=35070 G3=Y-4 G2=Y-3 G1=Y-2 B4=Y-1 B3=Y+1 B2=Y+2 Y=0120 S=0 L=0 P=32 H8="0000"
20 POKEY=9.240 POKESC=170 PRINT"*****COSMIC BUGS" PRINT"*****C01904 S.L.VON"
30 PRINT"*****FINISH CHARACTERS" PRINT"*****PLEASE WAIT"
40 POKEY=10 FORN1=1T00 READG3,G2 POKES3,G2 FORM=8T00S400 NEXTN1,P1 POKES3,0 G0T0000
50 B4T014,6,210,6,209,6,162,6,193,10
55 PRINT"*****HIT ANY KEY TO START"
60 G3T00 IFB4="*****THENG3
67 G0S00000
69 POKEY=9.250 POKESC=10
70 PRINT"*****"
80 FORM1=30466T000400 POKES1,0 NEXT C3=30720 S=22 U=44 FORM1=30466T000400 POKES1,7 NEXT
90 PRINT"*****"
100 PRINT"*****COSMIC BUGS*****" POKES1,150 POKES1,150 POKES1,150 POKES1,150
110 PRINTB4="B-POKEY=H4T01173,L P1H4T01173
120 B=7746 POKES4,B,P POKES4=B+1,P POKES4=B+2,P
130 B=54T000011419545 POKES4,B,32 POKES4=B+1,32 POKES4=B+2,32
140 G3=0 G=0T0100T01000000
150 FORT1=1T00725T00 POK1=240T00000STEP=040
160 IFB4="H4T01173+022+43TH000000000
170 POKES4+B+1,32 POKES4+B+1,CS,1 POKES4+B+1,P POKES2,1 G0S00170 NEXT1,T G0T0020
179 Z=POKEY197
180 IFB4="1<,&1TH00H=57 G0S00000
190 IFB4="1<,&2TH00H=36 G0S00000
200 IFB4="1<,&3TH00H=47 G0S00000
210 POKES4,B,P POKES4=B+1,P
220 IFZ=37TH00H=H-5
230 IFZ=37TH00H=H-5
240 IFZ=37TH00H=H-5
250 POKES4,B POKES4+B+CS,6 POKES4+B+1,32 POKES4+B+1,CS,6 RETURN
260 POKES2,0 FORP=8T00000STEP POKES4,250 POKES4=B,32 POKES4=B+1,32
270 POKES4+B+1,32 POKES4+B+1,32 POKES4+B+1,32 POKES4+B+1,32
280 POKES4,B POKES4+B+H4T01173-L POKES4+B+1,32
290 IFB4="37TH00H=5436 G0S00000
300 IFB4="37TH00H=5436 G0S00000
310 IFB4="37TH00H=5436 G0S00000
320 H4T01173
330 POKES4+B+1,0-P,U POKES4+B+1,0-P4CS,2 FORT1=300T01000STEP=1 POKES4,T1 NEXT
340 POKES4+B+1,0-P POKES4,B G0S00000 G0T0170
350 PRINTB4="B,P S PRINTH4T01173,L POKES4+B+1,32
360 IFCC=200000=0000TH000000000000 C0=1
370 RETURN
380 POKES2,0 FORT1=1T00 B=H4T01173+220+100
390 FORM1=250T01000STEP=1 POKES3,P1 NEXT
400 POKES4,B,32 POKES4+B+CS,7
410 POKES3,0 RETURN
420 POKES2,0 FORM1=150T0250 POKES3,H1 NEXT POKES3,0 FORM1=250T01000STEP=1 POKES4,01 NEXT
430 POKES4+B+1,32 U/L-1 SFL=8TH00000000

```

```

200 00000000
205 00000000
210 00000000
215 00000000
220 00000000
225 00000000
230 00000000
235 00000000
240 00000000
245 00000000
250 00000000
255 00000000
260 00000000
265 00000000
270 00000000
275 00000000
280 00000000
285 00000000
290 00000000
295 00000000
300 00000000
305 00000000
310 00000000
315 00000000
320 00000000
325 00000000
330 00000000
335 00000000
340 00000000
345 00000000
350 00000000
355 00000000
360 00000000
365 00000000
370 00000000
375 00000000
380 00000000
385 00000000
390 00000000
395 00000000
400 00000000
405 00000000
410 00000000
415 00000000
420 00000000
425 00000000
430 00000000
435 00000000
440 00000000
445 00000000
450 00000000
455 00000000
460 00000000
465 00000000
470 00000000
475 00000000
480 00000000
485 00000000
490 00000000
495 00000000
500 00000000
505 00000000
510 00000000
515 00000000
520 00000000
525 00000000
530 00000000
535 00000000
540 00000000
545 00000000
550 00000000
555 00000000
560 00000000
565 00000000
570 00000000
575 00000000
580 00000000
585 00000000
590 00000000
595 00000000
600 00000000
605 00000000
610 00000000
615 00000000
620 00000000
625 00000000
630 00000000
635 00000000
640 00000000
645 00000000
650 00000000
655 00000000
660 00000000
665 00000000
670 00000000
675 00000000
680 00000000
685 00000000
690 00000000
695 00000000
700 00000000
705 00000000
710 00000000
715 00000000
720 00000000
725 00000000
730 00000000
735 00000000
740 00000000
745 00000000
750 00000000
755 00000000
760 00000000
765 00000000
770 00000000
775 00000000
780 00000000
785 00000000
790 00000000
795 00000000
800 00000000
805 00000000
810 00000000
815 00000000
820 00000000
825 00000000
830 00000000
835 00000000
840 00000000
845 00000000
850 00000000
855 00000000
860 00000000
865 00000000
870 00000000
875 00000000
880 00000000
885 00000000
890 00000000
895 00000000
900 00000000
905 00000000
910 00000000
915 00000000
920 00000000
925 00000000
930 00000000
935 00000000
940 00000000
945 00000000
950 00000000
955 00000000
960 00000000
965 00000000
970 00000000
975 00000000
980 00000000
985 00000000
990 00000000
995 00000000

```

## Autorun

This file is a program that runs from the  
 directory of the program.

When run, AUTORUN creates a short  
 program which enables RUN/STOP and  
 RESTORE and then LOADS and RUNS  
 the next program on the tape. The method  
 used to achieve this is as follows:

The basic system start file vector (M000  
 address) with the address of our own  
 machine code vector, which then takes  
 over after the load is completed. Save the  
 program before running.

```

0 REMXXX AUTO RUN XXX
1 REMXXX (C) J. LUNDY 1984 XXX
2 REM THIS SHORT PROGRAM WILL PROVIDE AN
  AUTO RUN LOADER WHICH WILL LOAD AND RUN
3 REM THE USERS OWN PROGRAMS XXX
4 REMA RUN/STOP & RESTORE ARE DISABLED X
  7 .
5 REMXXXXXXXXXXXXXXXXXXXXXXXXXXXX
6 :
7 :
8 :
9 :
10 FOR A= 073 TO 087
11 READ D
12 POKEA,D
13 CHK=CHK+D:NEXT
14 IFCHK<02728THENPRINT"DATA ERROR!"END
15 POKE43,101:POKE44,2
16 POKE45,18:POKE46,3
17 POKE728,101:POKE771,2
18 SAVE PROGRAM NAME ,1,1
19 BYE1824
20 :
21 :
22 REMXXXXXXXXXXXXXXXXXXXXXXXXXXXX
23 :
24 DATA185,186,187,131,142,2,3,141
25 DATA3,142,119,2,282,382,142
26 DATA9,3,183,1,133,198,76,138
27 DATA227

```



## Debate

This Commission of program comes from  
J. A. Clark of Colorado

Then short routines can be added to any Commodore 64 program in order to define a range of lines from within the program. Users with Simon's Basic or a similar package can add the routine using the BASIC editor.

Deleting or saving just parts of a program can usually be achieved by loading to the screen, MOWing, and re-saving using **REPLINK** files for larger sections. This routine can save time, though a link's particularly fast.

```

00000 REM***ROUTINE TO DELETE LINES FROM SPECIFIED START NO TO FINISH NO
00010 INPUT"START NO",SX
00020 INPUT"FINISH NO",FX
00030 INPUT"INTERVAL",IX
00040 CT=SX
00050 PRINTCH$$(147);CT
00060 PRINT"FX=";FX;"IX=";IX;"CT=";CT;IX;" ";PRINT"0006000"
00070 POKE631,19:POKE632,13:POKE633,13:POKE634,13:POKE193,4
00080 IFCT>FXTHENGOTO100
00090 END
00100 RETURN:POKEC""TO193:GOTO100

```

Send us your CommShare programs, including a cassette — and a photo of you in a white paper! If possible, include a letter about how you got involved in the program. We'll include that information about the program and a photo along with the cassette. We pay \$4.00 for each new letter published. We cannot guarantee the return of your programs unless they are printed in our copy. If you want us to return your letter, you must include a stamped, self-addressed envelope. If you have a mailing label, please use it. Please send your letter to: **CommShare, Inc., P.O. Box 1000, Portland, ME 04112.**

Correspondence: H. Kawanishi, 7-3-1 Utsunomiya Higashi 1-chome, Maebashi, Tokyo 381, Japan.

**THE EASY WAY  
TO KEEP YOUR  
RECIPES.**

Searching through hundreds of recipes taken from magazines for exactly the kind you want to see can be almost impossible, but is easy with your Commodore 64.

[illegible]

You build up your record as you get new recipes and friends to help in a program.

**TRAVELER INFORMATION FOR THE EL PASO AIRPORT**

© 2006 Blackwell Publishing Ltd, *Journal of Internal Medicine* 260: 103–110

VIC 20 WORD PROCESSOR -  
VICTEXT

**Proseur and producer:** Fathallah-Bejnordi. **Large red bottle, 750 ml, corked and sealed, avoid heat, store horizontally and avoid light.** **Price:** \$14.99. **Only available with participating wine or beer purchases. Offer valid 12/1/16 - 1/31/17.**

## VIC 30 FILE - DATA FILE

© 2000 Blackwell Science Ltd *Journal of Internal Medicine* 247: 399–406

all computers with full capabilities and operators and use in legal with a clear  
 manual. VSI systems including ESD groups, groups and page numbers upon  
 initiation (operator manual) if needed. Also includes VSI training and test  
 manual by the system user.

**A & C SOFTWARE**  
Dept. 1, 75 Oakthrop Gardens,  
Teddley, West Midlands B29 2JF

## PEAK/OFT CRICKET

**BRITAIN'S  
NO 1  
CRICKET  
GAME!**

**Total joystick control over brilliant 3D graphics!**



**Warning:** These fields are optional. Supplying all needed input variables is recommended.

**Best thing:**  
"I've never used any other laptop before, and I love it."

100

It will break / contradict / bowling averages / batting are  
 something else

Check with your retailer, slip the magnet on phone ring. Access  
Jing market for 30 hour download.

PEARSON, 86 CLEVER STREET, SALFORD, MANCHESTER  
M6 6PU  
Tel 061 275 3131 (4 lines)

Plasma levels and time course of C-peptide following administration of 0.1, 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.6, 2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.0, 4.2, 4.4, 4.6, 4.8, 5.0, 5.2, 5.4, 5.6, 5.8, 6.0, 6.2, 6.4, 6.6, 6.8, 7.0, 7.2, 7.4, 7.6, 7.8, 8.0, 8.2, 8.4, 8.6, 8.8, 9.0, 9.2, 9.4, 9.6, 9.8, 10.0, 10.2, 10.4, 10.6, 10.8, 11.0, 11.2, 11.4, 11.6, 11.8, 12.0, 12.2, 12.4, 12.6, 12.8, 13.0, 13.2, 13.4, 13.6, 13.8, 14.0, 14.2, 14.4, 14.6, 14.8, 15.0, 15.2, 15.4, 15.6, 15.8, 16.0, 16.2, 16.4, 16.6, 16.8, 17.0, 17.2, 17.4, 17.6, 17.8, 18.0, 18.2, 18.4, 18.6, 18.8, 19.0, 19.2, 19.4, 19.6, 19.8, 20.0, 20.2, 20.4, 20.6, 20.8, 21.0, 21.2, 21.4, 21.6, 21.8, 22.0, 22.2, 22.4, 22.6, 22.8, 23.0, 23.2, 23.4, 23.6, 23.8, 24.0, 24.2, 24.4, 24.6, 24.8, 25.0, 25.2, 25.4, 25.6, 25.8, 26.0, 26.2, 26.4, 26.6, 26.8, 27.0, 27.2, 27.4, 27.6, 27.8, 28.0, 28.2, 28.4, 28.6, 28.8, 29.0, 29.2, 29.4, 29.6, 29.8, 30.0, 30.2, 30.4, 30.6, 30.8, 31.0, 31.2, 31.4, 31.6, 31.8, 32.0, 32.2, 32.4, 32.6, 32.8, 33.0, 33.2, 33.4, 33.6, 33.8, 34.0, 34.2, 34.4, 34.6, 34.8, 35.0, 35.2, 35.4, 35.6, 35.8, 36.0, 36.2, 36.4, 36.6, 36.8, 37.0, 37.2, 37.4, 37.6, 37.8, 38.0, 38.2, 38.4, 38.6, 38.8, 39.0, 39.2, 39.4, 39.6, 39.8, 40.0, 40.2, 40.4, 40.6, 40.8, 41.0, 41.2, 41.4, 41.6, 41.8, 42.0, 42.2, 42.4, 42.6, 42.8, 43.0, 43.2, 43.4, 43.6, 43.8, 44.0, 44.2, 44.4, 44.6, 44.8, 45.0, 45.2, 45.4, 45.6, 45.8, 46.0, 46.2, 46.4, 46.6, 46.8, 47.0, 47.2, 47.4, 47.6, 47.8, 48.0, 48.2, 48.4, 48.6, 48.8, 49.0, 49.2, 49.4, 49.6, 49.8, 50.0, 50.2, 50.4, 50.6, 50.8, 51.0, 51.2, 51.4, 51.6, 51.8, 52.0, 52.2, 52.4, 52.6, 52.8, 53.0, 53.2, 53.4, 53.6, 53.8, 54.0, 54.2, 54.4, 54.6, 54.8, 55.0, 55.2, 55.4, 55.6, 55.8, 56.0, 56.2, 56.4, 56.6, 56.8, 57.0, 57.2, 57.4, 57.6, 57.8, 58.0, 58.2, 58.4, 58.6, 58.8, 59.0, 59.2, 59.4, 59.6, 59.8, 60.0, 60.2, 60.4, 60.6, 60.8, 61.0, 61.2, 61.4, 61.6, 61.8, 62.0, 62.2, 62.4, 62.6, 62.8, 63.0, 63.2, 63.4, 63.6, 63.8, 64.0, 64.2, 64.4, 64.6, 64.8, 65.0, 65.2, 65.4, 65.6, 65.8, 66.0, 66.2, 66.4, 66.6, 66.8, 67.0, 67.2, 67.4, 67.6, 67.8, 68.0, 68.2, 68.4, 68.6, 68.8, 69.0, 69.2, 69.4, 69.6, 69.8, 70.0, 70.2, 70.4, 70.6, 70.8, 71.0, 71.2, 71.4, 71.6, 71.8, 72.0, 72.2, 72.4, 72.6, 72.8, 73.0, 73.2, 73.4, 73.6, 73.8, 74.0, 74.2, 74.4, 74.6, 74.8, 75.0, 75.2, 75.4, 75.6, 75.8, 76.0, 76.2, 76.4, 76.6, 76.8, 77.0, 77.2, 77.4, 77.6, 77.8, 78.0, 78.2, 78.4, 78.6, 78.8, 79.0, 79.2, 79.4, 79.6, 79.8, 80.0, 80.2, 80.4, 80.6, 80.8, 81.0, 81.2, 81.4, 81.6, 81.8, 82.0, 82.2, 82.4, 82.6, 82.8, 83.0, 83.2, 83.4, 83.6, 83.8, 84.0, 84.2, 84.4, 84.6, 84.8, 85.0, 85.2, 85.4, 85.6, 85.8, 86.0, 86.2, 86.4, 86.6, 86.8, 87.0, 87.2, 87.4, 87.6, 87.8, 88.0, 88.2, 88.4, 88.6, 88.8, 89.0, 89.2, 89.4, 89.6, 89.8, 90.0, 90.2, 90.4, 90.6, 90.8, 91.0, 91.2, 91.4, 91.6, 91.8, 92.0, 92.2, 92.4, 92.6, 92.8, 93.0, 93.2, 93.4, 93.6, 93.8, 94.0, 94.2, 94.4, 94.6, 94.8, 95.0, 95.2, 95.4, 95.6, 95.8, 96.0, 96.2, 96.4, 96.6, 96.8, 97.0, 97.2, 97.4, 97.6, 97.8, 98.0, 98.2, 98.4, 98.6, 98.8, 99.0, 99.2, 99.4, 99.6, 99.8, 100.0, 100.2, 100.4, 100.6, 100.8, 101.0, 101.2, 101.4, 101.6, 101.8, 102.0, 102.2, 102.4, 102.6, 102.8, 103.0, 103.2, 103.4, 103.6, 103.8, 104.0, 104.2, 104.4, 104.6, 104.8, 105.0, 105.2, 105.4, 105.6, 105.8, 106.0, 106.2, 106.4, 106.6, 106.8, 107.0, 107.2, 107.4, 107.6, 107.8, 108.0, 108.2, 108.4, 108.6, 108.8, 109.0, 109.2, 109.4, 109.6, 109.8, 110.0, 110.2, 110.4, 110.6, 110.8, 111.0, 111.2, 111.4, 111.6, 111.8, 112.0, 112.2, 112.4, 112.6, 112.8, 113.0, 113.2, 113.4, 113.6, 113.8, 114.0, 114.2, 114.4, 114.6, 114.8, 115.0, 115.2, 115.4, 115.6, 115.8, 116.0, 116.2, 116.4, 116.6, 116.8, 117.0, 117.2, 117.4, 117.6, 117.8, 118.0, 118.2, 118.4, 118.6, 118.8, 119.0, 119.2, 119.4, 119.6, 119.8, 120.0, 120.2, 120.4, 120.6, 120.8, 121.0, 121.2, 121.4, 121.6, 121.8, 122.0, 122.2, 122.4, 122.6, 122.8, 123.0, 123.2, 123.4, 123.6, 123.8, 124.0, 124.2, 124.4, 124.6, 124.8, 125.0, 125.2, 125.4, 125.6, 125.8, 126.0, 126.2, 126.4, 126.6, 126.8, 127.0, 127.2, 127.4, 127.6, 127.8, 128.0, 128.2, 128.4, 128.6, 128.8, 129.0, 129.2, 129.4, 129.6, 129.8, 130.0, 130.2, 130.4, 130.6, 130.8, 131.0, 131.2, 131.4, 131.6, 131.8, 132.0, 132





# User-friendly programming on the C16 and Plus/4

An extract from Brian Lloyd's *Commodore 16 — Plus/4 companion*

FOR A COMPUTER program to be really good it must be 'user friendly', which means that whenever the program is given full instructions as to how to use the program properly, and that whenever that user does, however stupid, the program should carry on waiting and tell the user what he or she has done wrong. To help you to write such programs your computer has been supplied with error trapping facilities, so that if, for example, you press the RUN/STOP key when you do not want to, then the program will be able to explain what you have done wrong. Figure one is a short program which illustrates this.

Lines 140 to 148 in the code show that this is the end of the error-trapping subroutines, and then jumps to line 20 to continue with the program from there.

There is another version of the RESUME statement — RESUME NEXT. This continues with the computer to go to the next program and carry on with it from the NEXT statement after the one which caused the error. For instance, change line 140 to:

140 RESUME NEXT

then type RUN. At some point press the RUN/STOP key. You will receive the same message telling you that you should not have

## PRINT ERRORS

You will see the message MANUAL QUANTITY displayed on the screen. You can use the F1 key to find the message for any error number except those which refer to the disk drive.

The HELP command is extremely useful for when you are trying to find a mistake in a program line. If, for instance, you have a line with four or five commands in it, and you know that there is a mistake on that line but do not know where, you simply have to type HELP and the line with the mistake as it will appear on the screen. The next command with the number will flash on that you are already in. If you type the HELP command will only work after you have entered an error message (usually the two marked HELP has the same effect as typing HELP).

It is very rare when a program of any length or complexity would first find finding real errors into ones which the computer spots as errors and tells you ahead of any problems, especially with the HELP command. However, there are often bugs in the program which, although the program works, prevents the program from doing exactly what it is supposed to do.

In order to assist the programmer of huge machines your computer has been given two commands — TRIM and TRIM? The TRIM command tells the computer to turn the TRIMCON when the program the computer will display the line number of the line which is currently being carried on on the screen, so as soon as you see the message you can look to see which line is being carried out, and that will be the line with the mistake in it.

For instance, if we entered the message on line 20 of program one to read SAUSAGE AND MASH instead of BEANS ON TOAST we could use the TRIM? command to find the line which displays the message BEANS ON TOAST. I know you can see it, but in a program with about 200 lines it would be a lot more difficult to spot, and this is an example. So, type in the program, type TRIM? and then RUN the program.

```
10 SGNCLR
20 PRINT "BEANS ON TOAST"
30 FOR N=1 TO 10
40 PRINT "THIS IS A TEST"
50 NEXT N
```

As each line carried out you will see the line number appear enclosed in square brackets. If you type **TRIM?** appears on the message BEANS ON TOAST appears on the screen, so you will immediately be

```
10 TRAP 90
20 SGNCLR
30 PRINT "PLEASE DO NOT PRESS THE RUN/STOP KEY"
40 WHILE I FILL THE SCREEN WITH 0'S
50 FOR N=1 TO 500 NEXT N
60 FOR N=1 TO 1024 PRINT 0; NEXT N
70 FOR N=1 TO 500 NEXT N
80 RUN
90 SGNCLR
100 IF ER=N THEN PRINT "I ASKED YOU NOT TO PRESS THAT KEY" ELSE STOP
110 PRINT "NOW, I WILL START AGAIN"
120 PRINT "BUT PLEASE DO NOT PRESS THE RUN/STOP KEY"
130 FOR N=1 TO 5000 NEXT N
140 RESUME 20
```

Line 10 of this program contains the line of the error trapping commands — TRAP. This command tells the computer which line to jump to when it comes across an error. In this case the TRAP command tells the computer that if there is an error it should go to line 90 and carry on with the program from there.

The rest of the program is straightforward, until you come to line 100. In this line we refer to a variable, ER, which has not been assigned any value by the computer. This variable is a system variable, which is a variable used by the computer. ER contains the number of the last error which was made. Since the error number for pressing the RUN/STOP key (pressing the RUN/STOP key is coded as an error by the computer) is 90, the computer will carry on all the overflows from line 100 onwards only if the RUN/STOP key had been pressed.

Line 140 has another one command on it. The RESUME command allows the computer to continue with the main program after an error has occurred. RESUME is similar to GOTO except that it also marks the end of the error-trapping routine, so when the computer comes

pressed that key, and then, after a short pause, the computer will continue with the program from where it was stopped.

There is another system variable which is used the error. This variable is EL, and contains the line number in which the last error occurred. So if you change line 10 to:

```
10 EL=100
and RUN the program you will immediately get an error (obviously). If you now type
```

```
PRINT EL
the computer will display the number 10, which is the line in which the error occurred.

```

We know that the system variable ER contains the error number of the last error that occurred, but a number doesn't tell you much about what has happened. For instance, if you were told that error number 10 has just occurred you wouldn't be much the wiser. Fortunately, there is a function which helps us in this matter — ERR? If you type

```
PRINT ERR?
```

the computer will display the message SYNTAX on the screen. This is because error number 10 is a SYNTAX ERROR. Similarly, if you type



You will only be able to find the addresses of Jack Jones and Peter Johnson.

You may have thought up to now that when the computer reaches a READ statement it jumps to the line which has the DATA next and looks through the line for the next piece of DATA. This is not the case, however, and to prove this type TRIM and RUN the program. You will see that as you run the computer jumps to line 40 (a 90) to look through the DATA list. This is because the computer knows exactly where the next piece of DATA is stored in its memory, so it does not need to bother about line numbers, it goes straight there.

String variables are not really useful, and there are many ways in which you can chop them up and rearrange them to suit your needs.

If you are familiar with the commands IF THEN, you will understand how line 130 IF A\$ = "YES" OR A\$ = "Y" THEN works.

It would be much easier if we could test to see if the first letter of A\$ is a Y because then we could accept answers such as Y, YES, YEAH, or virtually any other version of the word YES starting with a Y. To do this we use the LEFT\$ command, like this: 130 IF LEFT\$(A\$,1) = "Y" THEN

This particular line tests to see what the first character of the variable A\$ is. If you change line 130 to:

130 IF LEFT\$(A\$,2) = "YE" THEN

then the computer will test to see what the first two characters of the variable A\$ are; line 2 in the LEFT\$ command tells the computer you want the first 2 characters, changing it to 1 would mean the first 1 character(s).

#### Variable

Of course, you don't have to use a string variable with the LEFT\$ command (for any of the other string handling commands, come to that), you could also use characters enclosed in quotation marks, like this: 130 IF LEFT\$("COMPUTER",1) = "C" THEN

Now is a short example program: 10 SCREEN: INPUT "DO YOU LIKE USING COMPUTERS?", C\$ 20 IF LEFT\$(C\$,1) = "Y" THEN PRINT "I'M GLAD ABOUT THAT!" 30 IF LEFT\$(C\$,1) = "N" THEN PRINT "OH, I'M NOT TO BLAME!"

The RIGHT\$ command is very similar to LEFT\$, except that LEFT\$ tells us to see what the first character(s) of a string are, but the RIGHT\$ command finds to see what the last character(s) of a string are. Try this example:

10 SCREEN: INPUT "TYPE IN SOMETHING PLEASE", S\$ 20 PRINT "THE NEXT 3 CHARACTERS THAT YOU TYPED IN WERE", 30 PRINT LEFT\$(S\$,3) PRINT "THE LAST 3 CHARACTERS THAT YOU TYPED IN WERE", 40 PRINT RIGHT\$(S\$,3)

The 3 in the RIGHT\$ command tells the computer that you want the last two characters of the string, and you can really be changed, just like the LEFT\$ command.

The MID\$ command is used to find out



what the middle characters are, rather than the beginning or end ones. Rather than just writing how many characters you want to test, as you do with the LEFT\$ and RIGHT\$ commands, you also have to say where you want to start from. For example, if you had a line such as this: 110 A\$ = "HELLO HELLO EVERYBODY"

then the computer will assign three characters from the middle of the string variable A\$ to the string variable B\$, with the first of these characters being the fourth character of the string variable A\$.

It is also possible to replace parts of a string variable by using the MID\$ command. Here is a short example program which does this:

10 SCREEN 1 20 A\$ = "HELLO HELLO EVERYBODY" 30 PRINT A\$ 40 MID\$(A\$,7,3) = "THERE" 50 PRINT A\$

If you look at line 40 you will see the MID\$ command being used to replace the word HELLO with THERE. This is done simply by telling the computer where in the string variable you want to start (the seventh character in the case) and how many characters you want to replace (in this example we want to replace five characters) and then tell the computer which characters you want to replace the old ones with. As you can see the replacement characters must be enclosed in quotation marks.

The INSTR\$ command is used to find out if one string is contained in another string. Try this short program:

10 SCREEN 1 20 A\$ = "PETER PETER PICKED A PECK OF PICKLED PEPPERS" 30 PRINT INSTR\$(A\$, "PICK")

When you RUN the program the number 11 will appear on the screen, because the P of the letters PICK is the 11th letter of the string variable A\$. What you have just told the computer to do is to search through the string variable A\$ to see

if the letters PICK are contained within it. If these letters are contained in A\$ then the computer will tell you exactly where the first letter of PICK appears in the string A\$.

If you look at the string A\$ you will see that the letters PICK appear twice, once in the word PICKED and once in the word PICKLED. The computer will only find the first occurrence of the characters which you are searching for. In order to make it find the second occurrence of the letters PICK you will have to change line 30 to: 30 PRINT INSTR\$(A\$, "PICK"), 15

When you RUN the program this time the number 14 will appear on the screen. This time the computer has started searching for the letters PICK at the 15th character of the string A\$. In other words, the computer will search through the letters CRED A PECK OF PICKLED PEPPERS for the first occurrence of the letters PICK, and find that the P of PICK is the 14th character of the string variable A\$.

If the computer cannot find the characters that you are searching for in the string then it will return the number 0.

#### Breaks

The LEN\$ command is used to find out the length of a string variable, or how many characters it contains. The short program illustrates the use of the command:

10 SCREEN 1 20 A\$ = "SUPER CALIFORNIA CALISTO EXHALADIOSUS" 30 PRINT "THE STRING VARIABLE 'A\$' CONTAINS", 40 PRINT LEN(A\$), "CHARACTERS"

As you can see, the string variable that you want to refer to must be enclosed in brackets after the LEN\$ command.

Don't Lloyd's article will be continued next month. The Commodore 16 — PLUS computer is published by Samsite Books at £9.95, and is available from bookshops or by mail order.

## Clear graphics

**Book:** *Commander of Generals Book 2*

**Author:** Gregg Barnett  
**Publisher:** Midwestern House  
**Price:** \$14  
**Reviewer:** Phil Sawyer

The main problem with books of programs (except an usually clarity, especially when graphics symbols are included, and the difficulty of keeping how many spaces to include within PRINT statements. Gregg Barnett's book solves the use of an on both covers. Special versions of the graphics characters have been used throughout, and they really are crystal clear. Instead of spaces, strange hang-like symbols have been printed, which are very simple to count, and a checkmark symbol is included to avoid the dreaded "Syntax Error" message.

The programs themselves are similar to those found in many other books of this type. Most of them are simple arcade-style games which, though similar to commercial machine-code products, are fun to play and make good use of graphics and sound. Some photographs are included, some of them being in color, but the descriptions of the games are rather too brief.

There is also a very useful machine-code section, presented in a basic format, for moving spaces around the screen, with examples of its use. This section works very well and could easily be incorporated in one's own game programs.

All in all, this is an excellent publication of its type, which I can recommend highly.

## Games galore

**Book:** *Great Book of Games for Your Commodore 64*

**Author:** Tim Horwell  
**Publisher:** Potomac  
**Price:** \$1.95  
**Reviewer:** Phil Sawyer

I'm not a lover of books of games, mostly because they are usually only a collection of programs that don't make the

grade—but with Tim Horwell as the helm the *Great Book of Games for Your Commodore 64* could well be an exception. It is. There are 46 offerings including arcade, card, memory and more games.

Some of the selections really are very good. *Parasol After*, *Tomahawk* (a superb tower game), *Hyper* and *Machete* and *Monkey Kong* are four of the titles included. Some are wrap-around screens, others have various levels of difficulty and a couple make good use of the SLD chip. There is a Typing Tutor program for those who wish to practice their keyboard skills. Each has an introduction, saying what is required of you along with an explanation of how the program works. Some of these are fairly detailed and quite useful to anyone wishing to understand the use and limits of how to achieve a good program. All the listings have been printed using the Via 1000 printer, making them easy to read.

At \$1.95, that's about nine pages per program. They are considerably better than that given the warning. If you are looking for a book of games, this one is well worth considering.

## Friendly start

**Book:** *Via 20 Machine Code*

**Author:** Steve Smith  
**Publisher:** Steve Publishing  
**Price:** \$3.95  
**Reviewer:** David Sheplevitch

This book is part of Steve's Friendly Mouse Series, and is an a subject close to my heart. To me it is not going to be a read in Horwell's *Devot* House, rather the two could be read in conjunction. It is an easy book to read, as the author has a sense of humor which shows through from time to time. Regrettably, the programs appear to have been copied rather than dumped off a printer. While this makes the code reading, it may allow easy mutation and conversion to compile. In general, however, there are lots of line explanations which should help to point to users from an amateur to more line.

In the program examples, the



data for the Machine Code is split into three columns, the first column gives the decimal value, the second the Hex and the third with Masmcode and Assembly. One thing I found confusing here was that in places, the Hex and Decimal values had been mixed up in the Assembly column, rather than sticking to either Hex or Decimal.

One good point is that confusion between 'D' and 'H' (D is decimal as it appears in the computer's version (as stated).

In general, the book is an excellent guide to Machine Coding, just a few problems to be wary of, but a great book with which to start learning Machine Code.

## Valuable guide

**Book:** *The Commodore 64 Handbook*  
**Authors:** Peter Lapsen and Peter Robinson  
**Publisher:** Country Communications  
**Price:** \$3.95  
**Reviewer:** Phil Sawyer

Since the first 64's were produced, with their wondrous capabilities. User's Guides,

there has been a mounting flood of books which have tried to put things right. This publication appears at first to be just one more, but when you examine it closely it proves to be far superior to the majority of such books.

This is the companion volume to *The Advanced Commodore 64 Handbook* by the same authors, and the more high standard is maintained throughout. Its brief is ideal for the beginner and provides enough material to keep him happily occupied for a long while.

In the first chapters simple information is given on setting up the machine and getting started. Then the authors launch into a thorough step-by-step examination of basic programming. Chapters are also included which explore the 64's special characteristics of sound, graphics and bit-mapped graphics. To illustrate the subject matter programs (except an usually sophisticated utilities, such as a screen editor, a user-defined graphics program and a database program. All of these are available on cassette from the publisher if required.

The usual appendices complete the book, which at \$3.95 must be excellent value for money.



# How to teach your Micro a thing or two

Thousands of home computer owners have yet to discover their microcomputer's potential to help with many of the problems and decisions that come up every day in the home or office.

Perhaps you have always promised yourself that you would teach yourself programming, but have been put off by materials which seem to require a lifetime spent studying computer science and mathematics. Maybe you have looked at other computer books, but have yet to find one which is free of unnecessary jargon or where the program examples bear some relevance to real life and not space war.

Relax, your search is over.

The 'Learn BASIC' tutorials from Logic 3 are the latest development of a teaching method pioneered by Professor Andrew Chan and perfected

by testing on 3 generations of students at Strathclyde University. The 'Sensible Method' has been translated into 6 languages and used by over 100,000 microcomputer users.

'Learn BASIC' is a jargon free, step by step, course in computer programming, which explains everything clearly in English, not computer talk. In a matter of hours you will be writing your first programs.

'Learn BASIC' is designed for people who want to keep abreast of the computer age, for people who realise that understanding computers is a key to future success at work, at school, and at a parent.

Get 'Learn BASIC' and teach your micro how to be useful! (Available from major branches of W. H. Smiths, Books, Libraries, Crooms, John Manns and better computer shops nationwide.)

Please send me more information about your

(Tick appropriate box)

- Learn BASIC\* tutorials ☐  
 Logic 3 Spectrum Club ☐  
 Logic 3 Commodore Club ☐  
 (H4 and VIC owners only)

Name   
 BLOCK CAPITALS PLEASE



I have a:

- Sinclair Spectrum ☐  
 Commodore 64 ☐  
 Acorn Electron ☐  
 BBC Microcomputer ☐  
 Dragon ☐

Address

(Postcode)

To Logic 3 Ltd., FREEPOST, Mountbatten House, Victoria Street, Windsor SL4 1HE

**WHATEVER**—Can making music take you over? you can win a copy of Jeff Minter's latest and wildest program. Not an arcade game, not an action game, game Psychodelia is a "trick" video for you. Can hooked to a joystick and comfortably to rest in your comfortable music, you can use the program to create fantastic, half shows on your computer screen. You control the position of the central camera and/or you move it around the scene, multi-colored lights change, explode into action. The music plays colors, depth, pattern, mode and character speed can be altered to suit you, and you can record your greatest Psychodelia performance to share your friends.

Psychodelia costs \$1.50 for the Commodore 64 and \$3 for the Vx, 20 and C16. We've purchased thousands to offer first copies of the program for each machine.

All you have to do to win is to suggest a name for the top prize was in the prize of \$100 and your answer on a POST CARD with your name, address, and the Commodore computer you own... and complete this to be broken in an arc, jumping and very well as in 1000 words or more. Psychodelia's game, idea, and sound features. Send with copy to: Commodore Computer, Commodore Home—1500 Little Newport News, London EC2M 3PP or send by the first working day in February. Winners will be announced in the April issue. Personal computer rules apply. ■

# Tripping the light fantastic

Psychodelia costs \$1.50 for the Commodore 64 and \$3 for the Vx, 20 and C16. We've purchased thousands to offer first copies of the program for each machine.



The winners of December's "British" Caragh Speech Synthesizer contest are: Jane Kennedy of Ealing, T. B. Thomas of Luton, Stephen Hunt of Heston Hill, Chris Wad of Isle of Man, Andrew Hughes of Hartford, D. F. Price of Ebbw Vale, D. B. Jones of Bristol, C. C. Harris of Woking, B. T. Edwards of Tadpoles and Peter Gledhill of London. The highest score, from Li Chi Jones Kennedy was 1126 words, scored from the Oxford English Dictionary, and all its supplements over a three day period. The runners-up averaged a paltry 280 words. Each will receive a Caragh Speech Synthesizer course, at home, the results of the British's electronic game. ■



COMMODORE 64

# OXFORD PASCAL



Oxford Computer courses  
written by  
experts  
Oxford 6400 2nd edition  
Telephone 0185 571111  
Telex 0185 571111

## Features

- A Pascal course with more features than any other
- A Pascal course with more features than any other
- A Pascal course with more features than any other

## Contents

- Chapter 1: Introduction to Pascal
- Chapter 2: Data types and expressions
- Chapter 3: Control structures
- Chapter 4: Functions and procedures
- Chapter 5: Files
- Chapter 6: Advanced topics

## Price

- £19.95 (hardcover)
- £14.95 (paperback)

# YOUR FUTURE WITH COMPUTERS DEPENDS ON PASCAL

## Why Pascal?

- It's the most powerful and flexible language for computers
- It's the most powerful and flexible language for computers
- It's the most powerful and flexible language for computers

## Why Oxford?

- Oxford's reputation for excellence in education
- Oxford's reputation for excellence in education
- Oxford's reputation for excellence in education

## Why 6400?

- The 6400 is the most powerful and flexible language for computers
- The 6400 is the most powerful and flexible language for computers
- The 6400 is the most powerful and flexible language for computers

# REAL ARCADE ACTION! FROM JETSOFT

**BMX STUNTS**

FAST LOAD 2 minutes

FAST LOAD 2 minutes

FAST LOAD 2 minutes

**Carcenon II**

FAST LOAD 2 minutes

FAST LOAD 2 minutes

FAST LOAD 2 minutes

**Quari Quari**

FAST LOAD 2 minutes

FAST LOAD 2 minutes

FAST LOAD 2 minutes

**JetSoft**

the arcade people

061 775 0333









[Home](#)
[About Us](#)
[Our Services](#)
[Our Clients](#)
[Our Projects](#)
[Our Team](#)
[Contact Us](#)

[illegible][illegible]

2004 04 programs, by using  
 Five stars 1000 and 500  
 you can see the results of the  
 1000 500 1000 500 1000  
 1000 500 1000 500 1000

**COMMODITY:** Ed games to  
young and old, includes a comic,  
American film, Marshall's  
National News Let. Place  
game (National) (70¢) and  
for Mark as well as to [1]  
Henderson as well. While all  
these, however, which are  
also, but in 1974 (see p. 1).

Child 14 continues to work to self-govern the Classroom W's. Each week, Susan has a day or night trip. Peter, Megan, Mike, Anne, Olympia, including Ben, Super Phoenix, and several other self-governed games, books, and activity materials.

Cable TV network exchange on  
cell - Savings of \$6,000  
Canada Tel Tel Tel Tel Tel Tel  
Saves us \$6,000 (\$4.00) -  
Maine Tel 40 Lillian Avenue  
BOSTON TEL TEL TEL TEL  
Tel TEL TEL TEL TEL TEL  
unpublished conditions

CPM 84 continues to expand its call list of non-programs, with its March 1987 Country Report listing South American CPMs 115 in telephone calls 245-24. . . all letters answered.

**THE SPECTRUM** also software  
many concerned with  
overweight (2 each of 14.99 reg)  
Ears, Am. (1st Pack) Post  
Cable, Wings and the Spades  
Paradise Casanova software  
P3 50 each includes Wings  
Post Many More through Best  
Value (see News Agent's  
Manager) 3 D South Africa  
Conqueror Flag Fantasy  
Games/Software (with more for  
Competition) 24 software

IBM 64 software to keep I have got titles such as *Outgoing*, *My Ancestors* & *Impassioned*. *Inside Bruce Lee World* shows *Master Fungo 1-on-1 Master* & *Ultimate Airfight*. *Offici*. *Passport* *Master Fall* *PC TECH*. *Gold* *Prize* *to* *Don* *Call* *Game*.

I built a Dragon 32 computer, ran programs like *Rocky* (1980) made of software, but to keep for Commodore 64. Contact J. Sullivan, 83 Commerce Park Road, Old Trolley Manufacturing Co. office.

1908, 1978 every CBM and  
credit? Or are want to  
exchange different? Contact  
Alfred Ruppel via Ben Pomeroy  
at 21212 College Avenue

IBM SA software is used.  
Many files including American  
Phone to Gary Johnson 22  
Secretary Mary Bellante  
Johnson LHM 270 or phone 681  
447 1000 anytime leaving the  
phone message and return

Java 2™ feature programs: Super  
Base, Jarrayprint, Jarraytable  
and Jarrayprint1 & 2. Jarray  
can do over 8000 per 1000 cases  
without using 1400 words/  
lines. (Source: Jarray manual.)

CBM 84 reflects its range from  
national issues like  
Machinists Union, Gar-  
ment Workers, and  
Public 2, to local  
issues like the  
Machinists Union, Gar-  
ment Workers, and  
Public 2, to local  
issues like the

**SLAPS TO SNAP**—and will, such as the *Snapping Shrimp Snaps* line and many more for the Commission. S.C. Contract and Co., Birmingham, 213-6416.

OPACIONS 22 a tres persones.  
Mantenen reserves. 16 places al  
meny. 6 locals. 1d menys 2:00  
menys. Call anytime after 1pm.  
All prices subject to 10% J.  
Smallman. 66 Comstock Park  
Road, Old Bedford, Massachusetts

**2004** We 20. Made Friends and  
Worked Cattle For Jolly  
Monsters From Robert about  
Born on Island in Hope (2004)  
14:10:00

CONTACT: 847-271-1100  
 1000 N. Dearborn St., Suite 200  
 Chicago, IL 60610

**WIN \$1000** We are now offering  
\$1000 for photos. Send us 2 color  
prints CORRECT and sharp with us.  
Exchange by date (preferred) or  
calendar. Send your letters to:  
**Peter Wagner - P.O. Box 2800**  
**Box 17 Mount Carmel**

CHD 84 continues to sweep and will bring American and English titles on Bush Rogers, David Cronenberg, Roger Dornall and Claude Goretta. Prices \$29.95. 1-800-762-2262, ext. 200, for details.

**TABLE I**

**FOR SALE** single light olive very good condition, also boxed Harley street (20) p.m. for me 20 computer. Please Richard. 8481176.

**PRINTING** (presses 27-30) with  
hot metal. Factory MCO  
characteristics 40 CPM  
Reduction for any machine  
computer 1 month old. The  
another printer in competition  
line condition with looking  
Any size 1170 Business  
BUTLER Job Order

AT&T WDC currently provides  
its sales to users includes parties  
like Long Distance, Cellular  
Business, Internet, Private  
Access, Global Access,  
Connect America, Super Cities,  
Voice Mail and CRM for All to  
Name a Few.

PTT/US joint directors for revenue data make blunders on a number of state, federal, congressional and state and local tax returns at the IRS and state and local tax departments.

**COMPARISON:** Most companies with 2542 had data for 1993's market. 88 use Symantec software. Morgan, 1993, 1st. Kaplan, 2072. FORT 20th place.

[illegible]

**Here's my FREE Classified Ad.**

PRIVATE ADVERTISERS ONLY

PLEASE WRITE YOUR COPY IN CAPITAL LETTERS ON THE LINES BELOW

[illegible]

100

**0000-0001-9786-430X**

**THE JOURNAL**

Fluorescence spectra were recorded with a Shimadzu RF-10A fluorescence spectrophotometer. The excitation wavelength was 280 nm and the emission wavelength was 300 nm. The fluorescence intensity was measured at 25 °C. The fluorescence spectra were recorded in 0.1 M NaOH solution. The fluorescence spectra were recorded in 0.1 M NaOH solution. The fluorescence spectra were recorded in 0.1 M NaOH solution.

CLASSIFIED DEPARTMENT  
COMMODORE HORIZONS  
12-13 LITTLE NEWPORT STREET,  
LONDON WC2E 8JQ

## ANSWER BACK

### Random access

I AM WRITING a program to machine code which requires a random number between 0 and 255. I would prefer to use the 64's random number generator, but I don't know where to find or how to use any routines already in the 64's library.

Thomas Hearn  
High Wycombe  
Bucks

**RESPONSE:** It is equivalent to `RND(=N)` and needs the random number with a value dependent on `RAND`. A comment value can be added using this routine, but with random code it's quicker to store your own seed value directly into `RND` to `SET RND SEED` and a formula to calculate a new random number leaving the result in `RAND` and `RND` to `SET`. This operation is completely predictable. `SET RND SEED` uses `VIA` to generate a true random number, except that, where loops are very short, they may begin to show repetition. Try this routine:

```
SET SEED: loop random
num: add
LDA SE
FOR 255: data compare
loop
FOR 255
```

using four bytes including the required

For more detailed information see Dr. Martin Ware's forthcoming book *Programming the 64*, which is due for publication in March.

### Collision routine

I HAVE recently started writing a game in the 64 involving the use of sprites. Could you explain the use of the effect and collision flag? I've read several books but none of them seem to be clear enough on the subject.

Simon Mally  
Amp  
Skipton

**TO DETECT** collisions between sprites in Basic use the following:

```
FOR N = 0 TO 4
IF IF PEEKV = BRAND
N = N, THEN ...
```

and to go into the action of your program. This will check to see if sprite number N has collided with another sprite or sprite

```
OR IF PEEKV = BRAND
N = N, THEN ...
```

will check if sprite N has collided with a block, ground, obstacle. All of the sprites can be checked in this way, and the sprite number stored separately to be used in your game. There is an effect flag on C 6400 Basic, it may be that the books you have referred to are mis-naming the different sprite register positions.

### Picture music

I HAVE a 64 and am interested in techniques of displaying a picture while loading. If this is done by a machine code routine in commercial programs, is there any way to achieve the same effect in Basic?

I would also like to know how to play music while load

```
ing
Dave Barber
Dunsmuir
Bucks
FIRST CREATE your picture,
then use as the last line of the program
FOR 255:CONV=1:
NEXT "CONV" is the name
```

of the main program in Basic, the first program should be longer than the called program, though this is not necessary of calling machine code. The picture will remain on the screen until removed by a new program.

Made while loading is possible in several ways. You could use the music as a sprite in a machine code interrupt routine, in which case the music would continue playing while the new program starts executing.

A Basic program can create music and call a machine code program, while the music is playing, providing the new program does not load into the same area of memory as the Basic program and its variables, memory used so on. While loading

is complete the Basic program will return, and there can be devoted to a VICE call to the new program using the familiar procedure of

```
20 A = A + 1: IF A = 1 THEN
  VICE:GOTO
30 GOTO end of program
```

### Portable problem

I AM ONE of those people who could really make use of the Commodore 64/65 portable computers. Since I am stuck on the tape, I already own a standard C64 and a good deal of tape software, but have yet to convert the 64/65 to a C64 or a Commodore tape recorder.

At Agony/Deus  
Peters  
Dorset

**THE 64/65** are real solutions to this problem, since the 64/65 doesn't have a cassette port, and I haven't heard of any company offering to add one on. All you can do is convert your existing programs to disk either by using a tape-to-disk transfer utility or by transferring them through your software supplier, if disk versions are available. You will have to be prepared to pay rates, of course.

### Screen clear

I HAVE RECENTLY started programming on a C6400 and cannot understand how to clear part of the screen. The program is a children's game which deals up to about half a screen is covered normally, but I cannot clear the previous run displayed and answer, as it prints continuously below the previous question and answer. If I try `PRINT CHR$(147)` this clears the screen completely. Can you suggest how to solve this problem?

C A Roberts  
Croydon

On BASIC, using the `HOME` key is a reference point. You should use sufficient numbers of `CLSCREEN`, `RIGHT` and `CLSCREEN` `DOWN` symbols to reset input string (or prompt) should be overwriting the previous question and answer.

### Giving a prompt

CAN YOU GIVE me some advice on a program I am writing to produce percentage rates? I have produced the screen format and a sub-routine for performing the calculations. However, I do not see how I can bring the cursor to a particular position in a prompt for the operator to enter the figures.

A Johnson  
Ridgeway  
Oxford

As for a graphics screen, you should not convert raster codes to place the cursor in the right position. The human eye tends to give a reference point, and the cursor set the coordinates in placing the screen cursor. The alternative would be to `FOR` the values into screen memory by using `GOTO` to obtain the screen row corresponding to the `FOR` value.

### Underline method

I SOMETIMES find things I want to copy which feature underlined text, but when I run the programs the underlining in the listing always disappears. Could you let me know how to use underlining in programs?

Arnie Whistler  
London

THERE ARE two ways of looking at the question. Firstly, the underlining might have been underlined independently of the program in order to give them emphasis.

Secondly, you can use two program lines which have the same effect as underlining. Using, for instance

```
IF PRINT "HELLO"
PRINT "HELLO"
```

where "IF" represents the Commodore logo key with F, giving an underline character.

If you need help with a technical query or problem write to:  
Jack Cohen  
Commodore Hardware  
12-13 Little Newport  
Street London  
EC4N 3PP



NEW TRENDS  
TECHNOLOGY

0000-0001-9300-4000

[illegible]

100

[illegible]

1000

Variable	Mean	SD
WELL-BEING (1-4)	2.70	0.88
WELL-BEING (1-4)	2.70	0.88
WELL-BEING (1-4)	2.70	0.88
WELL-BEING (1-4)	2.70	0.88
WELL-BEING (1-4)	2.70	0.88
WELL-BEING (1-4)	2.70	0.88
WELL-BEING (1-4)	2.70	0.88
WELL-BEING (1-4)	2.70	0.88
WELL-BEING (1-4)	2.70	0.88

(Means and SDs continue for remaining 10)

© 2006 The Authors  
Journal compilation © 2006 Blackwell Publishing Ltd

Accounting Time Records	01 000
Cost Book	01 000
Club Memberships	01 000
Expense Account	01 000
Job Costing	01 000
Partnership Daybooks	01 000
Sales Invoices	01 000
Subsidiary Time Records	01 000

◎ 俗文化語彙 · 一

Leadership Training	\$1.00
Leadership Training: Networking	\$1.00
Leadership: Team Networking	\$1.00
Club Membership	\$1.00
Online Therapy/Work	\$1.00
Personalized Therapy/Work	\$1.00
Cash Back	\$1.00
Private Agency	\$1.00
Job Coaching & Referral	\$1.00
Group Network	\$1.00
Willow & Apartments	\$1.00
Non-Linear	\$1.00
Leadership: Personal space results	\$1.00
Non-Linear	\$1.00
Non-Linear: Job to	\$1.00
Non-Linear	\$1.00
Non-Linear: Personal space	\$1.00

[illegible]

Figure 1. (a) Schematic diagram of the experimental setup. (b) Schematic diagram of the experimental setup.

PRACTICE ALLIANCE	900 000	41 000
PRACTICE ALLIANCE	900 000	41 000
INVENTURE IN	800 000	39 000
IT'S A GOOD IDEA TO INVEST IN IT	800 000	39 000

[illegible]

ORDER FORM — **MAIL TO: RALPH**  
 — on page 44

[illegible]

Electricity (average cost [with 100 kilowatts])	...	1.80
Telephone Cost [40 minutes]	...	18.10
[modem rates]	...	31.10
<b>EAST LOADING</b>		
RAM (500 KBYTES)	...	40.00
Access to net	...	1.00

[illegible][illegible]

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2
--	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	---

<b>DEVELOPMENTAL AIDS</b> (Individual Courses) Easy to use handwriting program/complete program/lesson sheet <b>DATE WRITING FOR</b> program/complete <b>DATE &amp; CURRENCY</b> program/complete <b>BASES</b> with pocketed CIMA Base/complete <b>PROGRAMMING AND</b> <b>CARTERS</b>	 1.00  3.00 3.00 3.00 3.00
---	--

DOI: 10.1002/for

**PLEASE SPECIFY DELIVERY**  
method for details

Please add \$20 for orders under \$100 (Europe add \$15). Make cheques payable to **NEWTECHNICAL INFORMATION** - allow two weeks for delivery

24 North Audley Street, London  
WC1N 1BS, U.K. Tel: 01-477 0000

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

NEW FRIENDS: I'll  
enclose cheque/P.O. for £  
Please send me \_\_\_\_\_  
NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
\_\_\_\_\_

**TABLE 1**

04-90-01-100	100
04-90-01-101	101
04-90-01-102	102
04-90-01-103	103
04-90-01-104	104
04-90-01-105	105
04-90-01-106	106
04-90-01-107	107
04-90-01-108	108
04-90-01-109	109
04-90-01-110	110
04-90-01-111	111
04-90-01-112	112
04-90-01-113	113
04-90-01-114	114
04-90-01-115	115
04-90-01-116	116
04-90-01-117	117
04-90-01-118	118
04-90-01-119	119
04-90-01-120	120
04-90-01-121	121
04-90-01-122	122
04-90-01-123	123
04-90-01-124	124
04-90-01-125	125
04-90-01-126	126
04-90-01-127	127
04-90-01-128	128
04-90-01-129	129
04-90-01-130	130
04-90-01-131	131
04-90-01-132	132
04-90-01-133	133
04-90-01-134	134
04-90-01-135	135
04-90-01-136	136
04-90-01-137	137
04-90-01-138	138
04-90-01-139	139
04-90-01-140	140
04-90-01-141	141
04-90-01-142	142
04-90-01-143	143
04-90-01-144	144
04-90-01-145	145
04-90-01-146	146
04-90-01-147	147
04-90-01-148	148
04-90-01-149	149
04-90-01-150	150
04-90-01-151	151
04-90-01-152	152
04-90-01-153	153
04-90-01-154	154
04-90-01-155	155
04-90-01-156	156
04-90-01-157	157
04-90-01-158	158
04-90-01-159	159
04-90-01-160	160
04-90-01-161	161
04-90-01-162	162
04-90-01-163	163
04-90-01-164	164
04-90-01-165	165
04-90-01-166	166
04-90-01-167	167
04-90-01-168	168
04-90-01-169	169
04-90-01-170	170
04-90-01-171	171
04-90-01-172	172
04-90-01-173	173
04-90-01-174	174
04-90-01-175	175
04-90-01-176	176
04-90-01-177	177
04-90-01-178	178
04-90-01-179	179
04-90-01-180	180
04-90-01-181	181
04-90-01-182	182
04-90-01-183	183
04-90-01-184	184
04-90-01-185	185
04-90-01-186	186
04-90-01-187	187
04-90-01-188	188
04-90-01-189	189
04-90-01-190	190
04-90-01-191	191
04-90-01-192	192
04-90-01-193	193
04-90-01-194	194
04-90-01-195	195
04-90-01-196	196
04-90-01-197	197
04-90-01-198	198
04-90-01-199	199
04-90-01-200	200
04-90-01-201	201
04-90-01-202	202
04-90-01-203	203
04-90-01-204	204
04-90-01-205	205
04-90-01-206	206
04-90-01-207	207
04-90-01-208	208
04-90-01-209	209
04-90-01-210	210
04-90-01-211	211
04-90-01-212	212
04-90-01-213	213
04-90-01-214	214
04-90-01-215	215
04-90-01-216	216
04-90-01-217	217
04-90-01-218	218
04-90-01-219	219
04-90-01-220	220
04-90-01-221	221
04-90-01-222	222
04-90-01-223	223
04-90-01-224	224
04-90-01-225	225
04-90-01-226	226
04-90-01-227	227
04-90-01-228	228
04-90-01-229	229
04-90-01-230	230
04-90-01-231	231
04-90-01-232	232
04-90-01-233	233
04-90-01-234	234
04-90-01-235	235
04-90-01-236	236
04-90-01-237	237
04-90-01-238	238
04-90-01-239	239
04-90-01-240	240
04-90-01-241	241
04-90-01-242	242
04-90-01-243	243
04-90-01-244	244
04-90-01-245	245
04-90-01-246	246
04-90-01-247	247
04-90-01-248	248
04-90-01-249	249
04-90-01-250	250
04-90-01-251	251
04-90-01-252	252
04-90-01-253	253
04-90-01-254	254
04-90-01-255	255
04-90-01-256	256
04-90-01-257	257
04-90-01-258	258
04-90-01-259	259
04-90-01-260	260
04-90-01-261	261
04-90-01-262	262
04-90-01-263	263
04-90-01-264	264
04-90-01-265	265
04-90-01-266	266
04-90-01-267	267
04-90-01-268	268
04-90-01-269	269
04-90-01-270	270
04-90-01-271	271
04-90-01-272	272
04-90-01-273	273
04-90-01-274	274
04-90-01-275	275
04-90-01-276	276
04-90-01-277	277
04-90-01-278	278
04-90-01-279	279
04-90-01-280	280
04-90-01-281	281
04-90-01-282	282
04-90-01-283	283
04-90-01-284	284
04-90-01-285	285
04-90-01-286	286
04-90-01-287	287
04-90-01-288	288
04-90-01-289	289
04-90-01-290	290
04-90-01-291	291
04-90-01-292	292
04-90-01-293	293
04-90-01-294	294
04-90-01-295	295
04-90-01-296	296
04-90-01-297	297
04-90-01-298	298
04-90-01-299	299
04-90-01-300	300
04-90-01-301	301
04-90-01-302	302
04-90-01-303	303
04-90-01-304	304
04-90-01-305	305
04-90-01-306	306
04-90-01-307	307
04-90-01-308	308
04-90-01-309	309
04-90-01-310	310
04-90-01-311	311
04-90-01-312	312
04-90-01-313	313
04-90-01-314	314
04-90-01-315	315
04-90-01-316	316
04-90-01-317	317
04-90-01-318	318
04-90-01-319	319
04-90-01-320	320
04-90-01-321	321
04-90-01-322	322
04-90-01-323	323
04-90-01-324	324
04-90-01-325	325
04-90-01-326	326
04-90-01-327	327
04-90-01-328	328
04-90-01-329	329
04-90-01-330	330
04-90-01-331	331
04-90-01-332	332
04-90-01-333	333
04-90-01-334	334
04-90-01-335	335
04-90-01-336	336
04-90-01-337	337
04-90-01-338	338
04-90-01-339	339
04-90-01-340	340
04-90-01-341	341
04-90-01-342	342
04-90-01-343	343
04-90-01-344	344
04-90-01-345	345
04-90-01-346	346
04-90-01-347	347
04-90-01-348	348
04-90-01-349	349
04-90-01-350	350
04-90-01-351	351
04-90-01-352	352
04-90-01-353	353
04-90-01-354	354
04-90-01-355	355
04-90-01-356	356
04-90-01-357	357
04-90-01-358	358
04-90-01-359	359
04-90-01-360	360
04-90-01-361	361
04-90-01-362	362
04-90-01-363	363
04-90-01-364	364
04-90-01-365	365
04-90-01-366	366
04-90-01-367	367
04-90-01-368	368
04-90-01-369	369
04-90-01-370	370
04-90-01-371	371
04-90-01-372	372
04-90-01-373	373
04-90-01-374	374
04-90-01-375	375
04-90-01-376	376
04-90-01-377	377
04-90-01-378	378
04-90-01-379	379
04-90-01-380	380
04-90-01-381	381
04-90-01-382	382
04-90-01-383	383
04-90-01-384	384
04-90-01-385	385
04-90-01-386	386
04-90-01-387	387
04-90-01-388	388
04-90-01-389	389
04-90-01-390	390
04-90-01-391	391
04-90-01-392	392
04-90-01-393	393
04-90-01-394	394
04-90-01-395	395
04-90-01-396	396
04-90-01-397	397
04-90-01-398	398
04-90-01-399	399
04-90-01-400	400
04-90-01-401	401
04-90-01-402	402
04-90-01-403	403
04-90-01-404	404
04-90-01-405	405
04-90-01-406	406
04-90-01-407	407
04-90-01-408	408
04-90-01-409	409
04-90-01-410	410
04-90-01-411	411
04-90-01-412	412
04-90-01-413	413
04-90-01-414	414
04-90-01-415	415
04-90-01-416	416
04-90-01-417	417
04-90-01-418	418
04-90-01-419	419
04-90-01-420	420
04-90-01-421	421
04-90-01-422	422
04-90-01-423	423
04-90-01-424	424
04-90-01-425	425
04-90-01-426	426
04-90-01-427	427
04-90-01-428	428
04-90-01-429	429
04-90-01-430	430
04-90-01-431	431
04-90-01-432	432
04-90-01-433	433
04-90-01-434	434
04-90-01-435	435
04-90-01-436	436
04-90-01-437	437
04-90-01-438	438
04-90-01-439	439
04-90-01-440	440
04-90-01-441	441
04-90-01-442	442
04-90-01-443	443
04-90-01-444	444
04-90-01-445	445
04-90-01-446	446
04-90-01-447	447
04-90-01-448	448
04-90-01-449	449
04-90-01-450	450
04-90-01-451	451
04-90-01-452	452
04-90-01-453	453
04-90-01-454	454
04-90-01-455	455
04-90-01-456	456
04-90-01-457	457
04-90-01-458	458
04-90-01-459	459
04-90-01-460	460
04-90-01-461	461
04-90-01-462	462
04-90-01-463	463
04-90-01-464	464
04-90-01-465	465
04-90-01-466	466
04-90-01-467	467
04-90-01-468	468
04-90-01-469	469
04-90-01-470	470
04-90-01-471	471
04-90-01-472	472
04-90-01-473	473
04-90-01-474	474
04-90-01-475	475
04-90-01-476	476
04-90-01-477	477
04-90-01-478	478
04-90-01-479	479
04-90-01-480	480
04-90-01-481	481
04-90-01-482	482
04-90-01-483	483
04-90-01-484	484
04-90-01-485	485
04-90-01-486	486
04-90-01-487	487
04-90-01-488	488
04-90-01-489	489
04-90-01-490	490
04-90-01-491	491
04-90-01-492	492
04-90-01-493	493
04-90-01-494	494
04-90-01-495	495
04-90-01-496	496
04-90-01-497	497
04-90-01-498	498
04-90-01-499	499
04-90-01-500	500
04-90-01-501	501
04-90-01-502	502
04-90-01-503	503
04-90-01-504	504
04-90-01-505	505
04-90-01-506	506
04-90-01-507	507
04-90-01-508	508
04-90-01-509	509
04-90-01-510	510
04-90-01-511	511
04-90-01-512	512
04-90-01-513	513
04-90-01-514	514
04-90-01-515	515
04-90-01-516	516
04-90-01-517	517
04-90-01-518	518
04-90-01-519	519
04-90-01-520	520
04-90-01-521	521
04-90-01-522	522
04-90-01-523	523
04-90-01-524	524
04-90-01-525	525
04-90-01-526	526

THE QUALITY OF \_\_\_\_\_

1. 2010年10月1日起，凡在中华人民共和国境内销售货物或者提供加工、修理修配劳务以及进口货物的单位和个人，均应按照《中华人民共和国增值税暂行条例》及实施细则缴纳增值税。

COLLECTION English Language ... 60

0123456789

Country	Year	Value
Germany	1990	1.00
Germany	1991	1.00
Germany	1992	1.00
Germany	1993	1.00
Germany	1994	1.00
Germany	1995	1.00
Germany	1996	1.00
Germany	1997	1.00
Germany	1998	1.00
Germany	1999	1.00
Germany	2000	1.00
Germany	2001	1.00
Germany	2002	1.00
Germany	2003	1.00
Germany	2004	1.00
Germany	2005	1.00
Germany	2006	1.00
Germany	2007	1.00
Germany	2008	1.00
Germany	2009	1.00
Germany	2010	1.00
Germany	2011	1.00
Germany	2012	1.00
Germany	2013	1.00
Germany	2014	1.00
Germany	2015	1.00
Germany	2016	1.00
Germany	2017	1.00
Germany	2018	1.00
Germany	2019	1.00
Germany	2020	1.00
Germany	2021	1.00
Germany	2022	1.00
Germany	2023	1.00
Germany	2024	1.00
Germany	2025	1.00
Germany	2026	1.00
Germany	2027	1.00
Germany	2028	1.00
Germany	2029	1.00
Germany	2030	1.00
Germany	2031	1.00
Germany	2032	1.00
Germany	2033	1.00
Germany	2034	1.00
Germany	2035	1.00
Germany	2036	1.00
Germany	2037	1.00
Germany	2038	1.00
Germany	2039	1.00
Germany	2040	1.00
Germany	2041	1.00
Germany	2042	1.00
Germany	2043	1.00
Germany	2044	1.00
Germany	2045	1.00
Germany	2046	1.00
Germany	2047	1.00
Germany	2048	1.00
Germany	2049	1.00
Germany	2050	1.00
Germany	2051	1.00
Germany	2052	1.00
Germany	2053	1.00
Germany	2054	1.00
Germany	2055	1.00
Germany	2056	1.00
Germany	2057	1.00
Germany	2058	1.00
Germany	2059	1.00
Germany	2060	1.00
Germany	2061	1.00
Germany	2062	1.00
Germany	2063	1.00
Germany	2064	1.00
Germany	2065	1.00
Germany	2066	1.00
Germany	2067	1.00
Germany	2068	1.00
Germany	2069	1.00
Germany	2070	1.00
Germany	2071	1.00
Germany	2072	1.00
Germany	2073	1.00
Germany	2074	1.00
Germany	2075	1.00
Germany	2076	1.00
Germany	2077	1.00
Germany	2078	1.00
Germany	2079	1.00
Germany	2080	1.00
Germany	2081	1.00
Germany	2082	1.00
Germany	2083	1.00
Germany	2084	1.00
Germany	2085	1.00
Germany	2086	1.00
Germany	2087	1.00
Germany	2088	1.00
Germany	2089	1.00
Germany	2090	1.00
Germany	2091	1.00
Germany	2092	1.00
Germany	2093	1.00
Germany	2094	1.00
Germany	2095	1.00
Germany	2096	1.00
Germany	2097	1.00
Germany	2098	1.00
Germany	2099	1.00
Germany	2100	1.00
Germany	2101	1.00
Germany	2102	1.00
Germany	2103	1.00
Germany	2104	1.00
Germany	2105	1.00
Germany	2106	1.00
Germany	2107	1.00
Germany	2108	1.00
Germany	2109	1.00
Germany	2110	1.00
Germany	2111	1.00
Germany	2112	1.00
Germany	2113	1.00
Germany	2114	1.00
Germany	2115	1.00
Germany	2116	1.00
Germany	2117	1.00
Germany	2118	1.00
Germany	2119	1.00
Germany	2120	1.00
Germany	2121	1.00
Germany	2122	1.00
Germany	2123	1.00
Germany	2124	1.00
Germany	2125	1.00
Germany	2126	1.00
Germany	2127	1.00
Germany	2128	1.00
Germany	2129	1.00
Germany	2130	1.00
Germany	2131	1.00
Germany	2132	1.00
Germany	2133	1.00
Germany	2134	1.00
Germany	2135	1.00
Germany	2136	1.00
Germany	2137	1.00
Germany	2138	1.00
Germany	2139	1.00
Germany	2140	1.00
Germany	2141	1.00
Germany	2142	1.00
Germany	2143	1.00
Germany	2144	1.00
Germany	2145	1.00
Germany	2146	1.00
Germany	2147	1.00
Germany	2148	1.00
Germany	2149	1.00
Germany	2150	1.00
Germany	2151	1.00
Germany	2152	1.00
Germany	2153	1.00
Germany	2154	1.00
Germany	2155	1.00
Germany	2156	1.00
Germany	2157	1.00
Germany	2158	1.00
Germany	2159	1.00
Germany	2160	1.00
Germany	2161	1.00
Germany	2162	1.00
Germany	2163	1.00
Germany	2164	1.00
Germany	2165	1.00
Germany	2166	1.00
Germany	2167	1.00
Germany	2168	1.00
Germany	2169	1.00
Germany	2170	1.00
Germany	2171	1.00
Germany	2172	1.00
Germany	2173	1.00
Germany	2174	1.00
Germany	2175	1.00
Germany	2176	1.00
Germany	2177	1.00
Germany	2178	1.00
Germany	2179	1.00
Germany	2180	1.00
Germany	2181	1.00
Germany	2182	1.00
Germany	2183	1.00
Germany	2184	1.00
Germany	2185	1.00
Germany	2186	1.00
Germany	2187	1.00
Germany	2188	1.00
Germany	2189	1.00
Germany	2190	1.00
Germany	2191	1.00
Germany	2192	1.00
Germany	2193	1.00
Germany	2194	1.00
Germany	2195	1.00
Germany	2196	1.00
Germany	2197	1.00
Germany	2198	1.00
Germany	2199	1.00
Germany	2200	1.00
Germany	2201	1.00
Germany	2202	1.00
Germany	2203	1.00
Germany	2204	1.00
Germany	2205	1.00
Germany	2206	1.00
Germany	2207	1.00
Germany	2208	1.00
Germany	2209	1.00
Germany	2210	1.00
Germany	2211	1.00
Germany	2212	1.00
Germany	2213	1.00
Germany	2214	1.00
Germany	2215	1.00
Germany	2216	1.00
Germany	2217	1.00
Germany	2218	1.00
Germany	2219	1.00
Germany	2220	1.00
Germany	2221	1.00
Germany	2222	1.00
Germany	2223	1.00
Germany	2224	1.00
Germany	2225	1.00
Germany	2226	1.00
Germany	2227	1.00
Germany	2228	1.00
Germany	2229	1.00
Germany	2230	1.00
Germany	2231	1.00
Germany	2232	1.00
Germany	2233	1.00
Germany	2234	1.00
Germany	2235	1.00
Germany	2236	1.00
Germany	2237	1.00
Germany	2238	1.00
Germany	2239	1.00
Germany	2240	1.00
Germany	2241	1.00
Germany	2242	1.00
Germany	2243	1.00
Germany	2244	1.00
Germany	2245	1.00
Germany	2246	1.00
Germany	2247	1.00
Germany	2248	1.00
Germany	2249	1.00
Germany	2250	1.00
Germany	2251	1.00
Germany	2252	1.00
Germany	2253	1.00
Germany	2254	1.00
Germany	2255	1.00
Germany	2256	1.00
Germany	2257	1.00
Germany	2258	1.00
Germany	2259	1.00
Germany	2260	1.00
Germany	2261	1.00
Germany	2262	1.00
Germany	2263	1.00
Germany	2264	1.00
Germany	2265	1.00
Germany	2266	1.00
Germany	2267	1.00
Germany	2268	1.00
Germany	2269	1.00
Germany	2270	1.00
Germany	2271	1.00
Germany	2272	1.00
Germany	2273	1.00
Germany	2274	1.00
Germany	2275	1.00
Germany	2276	1.00
Germany	2277	1.00
Germany	2278	1.00
Germany	2279	1.00
Germany	2280	1.00
Germany	2281	1.00
Germany	2282	1.00
Germany	2283	1.00
Germany	2284	1.00
Germany	2285	1.00
Germany	2286	1.00
Germany	2287	1.00
Germany	2288	1.00
Germany	2289	1.00
Germany	2290	1.00
Germany	2291	1.00
Germany	2292	1.00
Germany	2293	1.00
Germany	2294	1.00
Germany	2295	1.00
Germany	2296	1.00
Germany	2297	1.00
Germany	2298	1.00
Germany	2299	1.00
Germany	2300	1.00
Germany	2301	1.00
Germany	2302	1.00
Germany	2303	1.00
Germany	2304	1.00
Germany	2305	1.00
Germany	2306	1.00
Germany	2307	1.00
Germany	2308	1.00
Germany	2309	1.00
Germany	2310	1.00
Germany	2311	1.00
Germany	2312	1.00
Germany	2313	1.00
Germany	2314	1.00
Germany	2315	1.00
Germany	2316	1.00
Germany	2317	1.00
Germany	2318	1.00
Germany	2319	1.00
Germany	2320	1.00
Germany	2321	1.00
Germany	2322	1.00
Germany	2323	1.00
Germany	2324	1.00
Germany	2325	1.00
Germany	2326	1.00
Germany	2327	1.00
Germany	2328	1.00
Germany	2329	1.00
Germany	2330	1.00
Germany	2331	1.00
Germany	2332	1.00
Germany	2333	1.00
Germany	2334	1.00
Germany	2335	1.00
Germany	2336	1.00
Germany	2337	1.00
Germany	2338	1.00
Germany	2339	1.00
Germany	2340	1.00
Germany	2341	1.00
Germany	2342	1.00
Germany	2343	1.00
Germany	2344	1.00
Germany	2345	1.00
Germany	2346	1.00
Germany	2347	1.00
Germany	2348	1.00
Germany	2349	1.00
Germany	2350	1.00
Germany	2351	1.00
Germany	2352	1.00
Germany	2353	1.00
Germany	2354	1.00
Germany	2355	1.00
Germany	2356	1.00
Germany	2357	1.00
Germany	2358	1.00
Germany	2359	1.00
Germany	2360	1.00
Germany	2361	1.00
Germany	2362	1.00
Germany	2363	1.00
Germany	2364	1.00
Germany	2365	1.00
Germany	2366	1.00
Germany	2367	1.00
Germany	2368	1.00
Germany	2369	1.00
Germany	2370	1.00
Germany	2371	1.00
Germany	2372	1.00
Germany	2373	1.00
Germany	2374	1.00
Germany	2375	1.00
Germany	2376	1.00
Germany	2377	1.00
Germany	2378	1.00
Germany	2379	1.00
Germany	2380	1.00
Germany	2381	1.00
Germany	2382	1.00
Germany	2383	1.00
Germany	2384	1.00
Germany	2385	1.00
Germany	2386	1.00
Germany	2387	1.00
Germany	2388	1.00
Germany	2389	1.00
Germany	2390	1.00
Germany	2391	1.00
Germany	2392	1.00
Germany	2393	1.00
Germany	2394	1.00
Germany	2395	1.00
Germany	2396	1.00
Germany	2397	1.00
Germany	2398	1.00
Germany	2399	1.00
Germany	2400	1.00
Germany	2401	1.00
Germany	2402	1.00
Germany	2403	1.00
Germany	2404	1.00
Germany	2405	1.00
Germany	2406	1.00
Germany	2407	1.00
Germany	2408	1.00
Germany	2409	1.00
Germany	2410	1.00
Germany	2411	1.00
Germany	2412	1.00
Germany	2413	1.00
Germany	2414	1.00
Germany	2415	1.00
Germany	2416	1.00
Germany	2417	1.00
Germany	2418	1.00
Germany	2419	1.00
Germany	2420	1.00
Germany	2421	1.00
Germany	2422	1.00
Germany	2423	1.00
Germany	2424	1.00
Germany	2425	1.00
Germany	2426	1.00
Germany	2427	1.00
Germany	2428	1.00
Germany	2429	1.00
Germany	2430	1.00
Germany	24	

[illegible]

<b>For the Commodore 64</b>	
Programs for Education on the Commodore 64	
John Iverson and Patricia Hall—	\$1.95 per
Artificial Intelligence for the Commodore 64	
Boyd and Steven Brown	\$4.95 per
Business Applications for the Commodore 64	
John Hall	\$3.95 per
Communications for the Commodore 64	
John Rasmussen	\$3.95 per
Control Systems for the Commodore 64	
David Lawrence	\$3.95 per
Commodore 64 Machine Code Monitor	
Bertil Lovstrand	\$3.95 per
Maths Designed	\$3.95 per
Graphical Art for the Commodore 64	
John Hall	\$3.95 per
Commodore 64 Adventures	
Mike Grant	\$3.95 per
Advanced Programming Techniques on the Commodore 64	
David Lawrence	\$3.95 per
File Handling and Storage for the Commodore 64	
John Rasmussen	\$3.95 per
Machine Code Games Routines for the Commodore 64	
David Brown	\$3.95 per
Contributors to Disk Competition	
David Lawrence	\$3.95 per
and Mark Rodwell	\$3.95 per
Installation Techniques on the Commodore 64	
John Iverson	\$3.95 per
Machine Code Emulators and Routines for the Commodore 64	
David Lawrence	\$3.95 per
Maths Designed	\$3.95 per
John Hall	\$3.95 per
Commodore 64 Music	
John Wright	\$3.95 per
<b>For the Commodore C64 and Plus II</b>	
<b>The Working Commodore C64</b>	
David Lawrence	\$5.95 per
<b>The Commodore C64/Plus II Companion</b>	

● 2014 年 12 月 1 日起, 凡在 2014 年 12 月 31 日前, 已在本市办理居住证登记的流动人口, 均可参加本市 2015 年度城乡居民基本医疗保险。

1. Section cheque (10) (not) \_\_\_\_\_  
 Please send me \_\_\_\_\_ copies of POUR LE QUATRE  
 N°101 \_\_\_\_\_  
 \_\_\_\_\_

# Dash for a Slomo



*If you can't keep up with your Commodore 64 this handy gadget can slow it down to your pace — and there are five to win in our ample contest*

**THIS MONTH** five lucky entrants will win Commodore 64 Slomos from Cambridge Computing.

The Slomo is a hand-held remote display controller which plugs into the 64's cartridge port. In operation, it introduces an adjustable interrupt into the machine's operating system, at a rate which can be varied by the speed control knob. In other words, Slomo lets you control the speed of programs as they run — slow them down, speed them up, or freeze them completely! And you can leave Slomo plugged in all the time.

It's a great aid in those difficult arcade games where the action is just too fast for you, or if you want to take screen photographs of your own programs. You can freeze the action at any time.

The Slomo sells for £14.95, but all you have to do to win one is solve the Wall Hook puzzle.

Marston has brought a set of enthusiasts into the Micro Club for the others to play with. When they're correctly assembled, they form a square from which can be read the binary numbers, five horizontally and five vertically. All the binary numbers have three

digits set to 1, and two to 0, but no number is the same as any other.

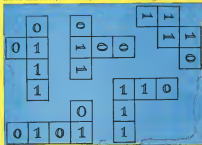
What you have to do is draw a diagram showing the assembled square, and complete the five binary numbers in an apt, original and amusing way as letters, words or phrases. "Slomo sets the pace

because

When you have done this, send your entry on a POSTCARD, with your name and address, to Slomo Competition, Commodore Horizons, 11/13 Little Newport Street, London WC2H 9PP to arrive by the last working day of February. Results will be

announced in the April issue. Usual competition rules apply.

The winners of the December Commodore competition are Jon Hyde-Oliver of Dabridge, who will receive a Plus4, and J D Pearce of Birmingham, who gets a C16, from Commodore UK. ■



# QUINX

*for Commodore 64*



Available now, price £6.95, from your Dealer or  
SUPERSOFT, WINCHESTER HOUSE, CANNING ROAD, HARROW



# Alice

## IN VIDEO LAND



**NOW  
ON  
CASSETTE**

PURE MAGIC!

Join Alice in her journey through Videoland - an enchanted place populated by strange creatures such as bread-and-butterflies and post-shaking campfires, where little gets shaken up and flamesigns turn into (magical) modern

*Alone in Videoland* is a revolutionary new concept in entertainment for the Commodore 64, incorporating some of the finest graphics ever seen on any home computer, accompanied by a charming musical score. There are four different game scenes included, and your performance in earlier ones will affect your ability to get through later ones and determine your overall final score.

**Score One** - Stunning title page graphics give way to the first game scene as Alice falls into the rabbit's warren. (Open points for collecting the objects to be found there - including keys to open doors, bottles to make her smaller, cakes to make her bigger)

**Inside Turn** – Did the garden the Climb on it looks asus Alice meets the post-smoking catpillar. Help her to catch the bread-and-butterfly and the rocking-horse flies that change into the balls used in the croquet game in the last world.

**Game Three:** Alice is a pawn in the Othello game where her opponents are the Jellibonwecky and Tweedledum and Tweedledee. Help her across the board by protecting her with your White Knight!

**Lesson Four** The most bizarre croquet game ever! Help Alice hit the balls through the playing-card-soldier hoops before the Queen of Hearts storms on ahead!

Also in Videoland is available for the Construction Ed no 854 - 612 95, and also no cassette - 66 95.

Also in Videoland features graphics created with the Snake Bar

**Audio-genic** LTD